Intimate partner violence:
Bringing facts into light under a public health perspective

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Abbreviations

IPV: Intimate partner violence

HRQoL: Health-related quality of life

DOVE: Domestic Violence against women/men in Europe

PROMO: Best Practice In Promoting Mental Health In Socially Marginalized People In Europe

CTS: Conflict Tactics Scales

AAS: Abuse Assessment Screen

UK: United Kingdom

SEP: Socioeconomic position

SF-36: Medical-Outcomes-Study 36-item Short-Form Health Survey

QISO: Quality Index of Service Organization

GDP: Gross Domestic Product

WHO: World Health Organization

GBD: Global Burden of Disease

DALY: Disability Adjusted Life Years

DHS: Demographic Health Survey

VAW: Violence against women

IVAWS: International Violence Against Women Study

USA: United States of America

CDC: Centers for Disease control and Prevention

BCS: British Crime Survey

EU: European Union

EIGE: European Institute for Gender Equality

Abstract

The contribution of violence to the overall burden of diseases and death is undeniable, yet avoidable. This recognition urges societies to make violent behavior visible and to eradicate it. Although various types of violence have been distinguished with victims and perpetrators being often found amongst the socially most vulnerable groups of the population, its pervasiveness suggests that a great amount of violent behavior is still invisible. Given its inherently private nature, intimate partner violence (IPV) is one of the hardest to grasp types of violence, but still one of the most frequently experienced, thus a challenge for the design of health initiatives and healthcare planning.

The work developed in this thesis aimed to address IPV in adults from developed societies. Following a public health perspective we performed seven studies, starting with a focus on methodological aspects of IPV measurement. Acknowledging that cross-regional comparisons are often hampered by different definitions and methodological choices, we conducted a population-based study to describe the magnitude of four IPV types experienced by women and men across six different European urban centers. Then, we explored socioeconomic inequalities in the expression of IPV in each gender and measured the impact of IPV in health-related quality of life (HRQoL). Turning our focus to healthcare, we synthesized a tool to measure the quality of mental healthcare provision to socially marginalized groups throughout Europe and explored country-level factors influencing such quality. In the last study presented in this thesis we tested whether IPV could be associated with the decision to forgone or delay healthcare.

To execute these series of studies, we used data gathered in the scope of two European projects. The DOVE project, a cross-sectional international multicenter study designed to measure IPV in the general population of adult men and women living in eight European cities was the basis for five studies of this thesis. The PROMO project, an international multicenter study conducted in 14 European cities designed to identify best practice in the delivery of health and social care for people with mental health problems who belong to one of six defined marginalized groups (long-term unemployed, homeless, street sex workers, asylum seekers/refugees, illegal immigrants and travelling communities) was the basis for one of this thesis' studies.

In the following paragraphs we present a brief description of the objectives, methods and results of each study performed.

Study I

We aimed to map existing evidence on strategies to measure male and female IPV. To pursue this goal we conducted a scoping review of the literature. Pubmed®, ISI Web of Knowledge® and Scopus® databases were searched from inception to 2014 and the abstracted information included type of instruments, samples, prevalence estimates, psychometrics and publications' year and region.

In total 1098 studies were analyzed. The most commonly followed strategy used all over the world to assess IPV, was the creation of study specific questions (30.3%). This was the preferred option found when dealing with large and community samples. Regarding standardized instruments, the Conflict Tactics Scales (CTS) was the most frequent choice, whereas for clinical samples, the preferred tool was the Abuse Assessment Screen (AAS). Prevalence estimates were generally higher when the original versions of the CTS were used. This review showed a predominance of studies from North America, which represents more than 50% of the publications analyzed.

Study II

In this methodological note we describe the design, methods, procedures and characteristics of the population involved in a multicenter international study designed to compare IPV in eight countries.

Electoral roles, municipal registries, random-route and random-digit-dialing were used to sample women and men aged 18-64, living in Ghent-Belgium (n=245), Stuttgart–Germany (n=546), Athens–Greece (n=548), Budapest–Hungary (n=604), Porto-Portugal (n=635), Granada–Spain (n=138), Östersund–Sweden (n=592) and London–United Kingdom (UK) (n=571). Three methods were used to administer different sections of a common questionnaire: self-completed (IPV), face-to-face (demographics, health) or mail. Five-age strata population fractions for sex and education were computed and population fraction ratios were used to evaluate samples' representativeness.

Differences in the age distributions were found among women from Sweden and Portugal and among men from Belgium, Hungary, Portugal and Sweden. Over-recruitment of more educated respondents was noted in all sites.

Study III

We aimed to assess four types of IPV among adult men and women from the general population of six different European urban centers (Athens, Budapest, London, Porto, Östersund and Stuttgart).

IPV types were measured with the Revised Conflict Tactics Scales (CTS2). Sex- and city-differences in past-year prevalence were examined considering victims, perpetrators or both and considering violent acts' severity and repetition.

Male victims of psychological aggression ranged from 48.8% (Porto) to 71.8% (Athens) and female victims from 46.4% (Budapest) to 70.5% (Athens). Male and female victims of sexual coercion ranged from 5.4% and 8.9% respectively in Budapest to 27.1% and 25.3% in Stuttgart. Male and female victims of physical assault ranged from 9.7% and 8.5% respectively in Porto, to 31.2% and 23.1% in Athens. Male victims of injury were 2.7% in Östersund and 6.3% in London and female victims were 1.4% in Östersund and 8.5% in Stuttgart. IPV differed significantly across cities. Men and women predominantly experienced IPV as both victims and perpetrators with few significant sex-differences within cities.

Study IV

We explored the association between socioeconomic position (SEP) and IPV considering the perspectives of men and women as victims, perpetrators and as both (bidirectional).

A total of 3496 adults (18-64 years) were randomly selected from the general population living in Athens, Budapest, London, Porto, Östersund and Stuttgart. Physical IPV was measured with the CTS2. Education (primary, secondary and university), occupation (upper white, lower white and blue collar) and unemployment duration (never, ≤12 months and >12 months) were considered SEP indicators. Logistic regression models were fitted and age- and city-adjusted odds ratios, 95% confidence intervals (OR, 95%CI) computed.

Past year physical IPV was declared by 17.7% of women (3.5% victims, 4.2% perpetrators and 10.0% bidirectional) and 19.8% of men (4.1% victims, 3.8% perpetrators and 11.9% bidirectional). In women, low educational level (primary vs. university) was associated with victimization (OR, 95%CI: 3.0, 1.2-7.5) and with bidirectional IPV (4.1, 2.4-7.1). Blue collar occupation (vs. upper white) in women was associated with victimization (2.1, 1.0-4.5), perpetration (3.1, 1.4-6.8) and bidirectional IPV (3.9, 2.3-6.8). Unemployment duration was associated with male perpetration (OR, 95%CI, in perpetrators with >12 months of unemployment vs. never unemployed: 3.4, 1.5-7.7) and with bidirectional IPV in both sexes (women: 1.8, 1.2-2.8; men: 1.7, 1.0-2.8).

Study V

We assessed HRQoL in the presence of physical and sexual IPV considering sex and violence directionality.

Adult men and women (n=3496), randomly selected from the general population of six European cities were assessed using the CTS2 and the Medical-Outcomes-Study 36-item Short-Form Health Survey (SF-36). Mean scores[standard error] of SF-36 physical and mental health summary scales in victims, perpetrators, bidirectional cases and those not involved in past-year physical assault and/or sexual coercion were compared using age-, education- and city-adjusted linear regression.

We found that the HRQoL physical dimension was significantly lower in women involved in bidirectional physical assault (48.00[0.58]) compared to those declaring no physical assault (49.75[0.26]). For the mental dimension, women involved in physical assault (as victims, perpetrators or both) presented significantly lower mean scores than women reporting no physical assault. Women victims-only of sexual coercion (44.74[0.86]) and victims or involved in bidirectional concomitant physical and sexual IPV (41.43[2.36] and 43.34[1.30], respectively) also presented lower mental mean scores. In men, significantly lower mental mean scores were found in the bidirectional physical assault group (46.34[0.78]) and among those involved bidirectionally in both physical and sexual IPV (46.17[1.30]).

Study VI

We assessed the organizational characteristics of services providing mental healthcare for marginalized groups in European capital cities and explored the associations between organizational quality, service features and country-level characteristics.

A total of 617 services were assessed in two highly deprived areas in 14 European capital cities. A Quality Index of Service Organization (QISO) was developed and applied across all sites. Service characteristics and country level socioeconomic indicators were tested and related with the Index using linear regressions and random intercept linear models.

The mean (standard deviation) of the QISO score (minimum= 0; maximum= 15) varied from 8.63 (2.23) in Ireland to 12.40 (2.07) in Hungary. The number of different programs provided was the only service characteristic significantly correlated with the QISO ($p<0.05$). The national Gross Domestic Product (GDP) was inversely associated with the QISO. Nearly 15% of the variance of the QISO was attributed to country-level variables, with GDP explaining 12% of this variance.

Study VII

We examined in a sample of European adult (18-64 years) men and women the relation between forgone healthcare and involvement in intimate partner violence (IPV) as victims, perpetrators or both (reciprocal or bidirectional violence)

We evaluated 3496 participants, randomly sampled from the general non-institutionalized population of six European cities (Athens, Porto, London, Budapest, Östersund and Stuttgart) who responded to a common questionnaire about IPV and health related characteristics. IPV was assessed with the CTS2 and forgone healthcare considered using the question “Have you been in need of a certain care service in the past year, but did not seek any help?”. To measure the association between forgoing healthcare and IPV, chi-square test was used in bivariate analysis and odd ratios and 95% confidence intervals (OR, 95%CI) were calculated fitting logistic regression models and considering potential confounders.

Participants who experienced any act of past year IPV reported more often to forgone healthcare compared to those not involved in violence (18.6% vs. 15.3%, p=0.016). Declaring to have been both a victim and a perpetrator of any violent act was associated with forgone healthcare, independently of having chronic diseases, their self-assessed health status or having felt financial strain (adjusted odds ratio, 95% confidence interval: 1.41, 1.09-1.81). An association of similar magnitude was observed among victims, although statistically non-significant (1.35, 0.89-2.04).

The main conclusion of these studies can be summarized as follows:

There are trends in the choice for a particular IPV measurement instrument according to the method of administration and setting of application. Clinical practice and research are hindered by lack of comprehensive evaluation of existing IPV screening tools and studies replicating associations between violence and health outcomes using similar measures of exposure are, therefore, needed.

In order to conduct a multicenter study on IPV, a number of distinct ethical and logistical challenges must be addressed. Limitations to the establishment of probabilistic samples and different methods of administration are plausible explanations for demographic differences observed across sites where such endeavor is performed. However, through the utilization of a common research protocol with the same structured questionnaire, accurate estimates of IPV frequency in the general population are possible to obtain.

Across the general population of adults residing in Athens, Budapest, London, Porto, Östersund and Stuttgart, the 12-month prevalence of psychological, physical, sexual and injury as forms of IPV, varies significantly, although few sex-differences are observed within cities. Most IPV is bidirectional or reciprocal, i.e., most subjects report they have been both victims and perpetrators of violent acts within their intimate relationships.

Furthermore, physical IPV is associated with a disadvantaged socioeconomic position and physical and sexual IPV negatively influence HRQoL, with lower scores in the mental component being evident among female victims and among males and females involved in

IPV bidirectionally. This supports the need for a gender-inclusive approach to IPV that considers the perspectives of both victims and perpetrators.

Looking from the perspective of healthcare provision, socioeconomic contextual factors, in particular the national GDP are likely to influence the organizational quality of services providing mental healthcare for marginalized or vulnerable groups. Also, the influence of IPV on forgone healthcare stresses the need to address IPV amongst barriers in the access to healthcare.

Resumo

A contribuição da violência para a carga global de doença e mortalidade é inegável, contudo evitável. Este reconhecimento incita as sociedades a tornar o comportamento violento visível e a erradicá-lo. Apesar de terem sido distinguidos vários tipos de violência com vítimas e agressores a serem frequentemente encontrados entre os grupos socialmente mais vulneráveis da população, a sua universalidade sugere que uma grande parte do comportamento violento permanece ainda invisível. Dada a sua inerente natureza privada, a violência entre parceiros íntimos (IPV) constitui um dos tipos de violência mais difíceis de alcançar, contudo um dos mais frequentemente vivenciados e, portanto, um desafio para o desenho de iniciativas em saúde e planeamento de cuidados.

O trabalho desenvolvido ao longo desta tese prende-se com a violência na relação íntima em sociedades desenvolvidas. Seguindo uma perspectiva de saúde pública, conduzimos sete estudos, começando por focar aspectos metodológicos da medição de IPV. Reconhecendo que as comparações inter-regionais são frequentemente dificultadas por escolhas metodológicas e definições diferentes, conduzimos um estudo de base populacional para descrever a magnitude de quatro tipos de IPV experienciados por mulheres e homens em seis diferentes centros urbanos Europeus. Seguidamente foram exploradas desigualdades socioeconómicas na expressão de IPV em cada género e medimos o impacto da IPV na qualidade de vida relacionada com a saúde (HRQoL). Focando-nos nos cuidados de saúde, sintetizamos uma ferramenta para a medição da qualidade da prestação de cuidados de saúde mental a grupos socialmente marginalizados na Europa e explorámos factores ao nível do país que influenciam tal qualidade. No último estudo apresentado, testamos se IPV poderia associar-se à decisão de adiar ou protelar cuidados de saúde.

Para a execução desta série de estudos, foram utilizados dados recolhidos no âmbito de dois projectos Europeus. O projecto DOVE, um estudo transversal multicêntrico e internacional desenhado para medir IPV em homens e mulheres adultos da população geral residentes em oito cidades Europeias, foi a base para cinco dos estudos desta tese. O projecto PROMO, um estudo multicêntrico internacional conduzido em 14 cidades Europeias e desenhado para identificar melhores práticas na prestação de cuidados sociais e de saúde a pessoas com problemas mentais pertencentes a um de seis grupos marginalizados definidos (desempregados de longa duração, sem-abrigo, trabalhadores sexuais de rua, refugiados/asilados, imigrantes irregulares e comunidades nómadas), foi a base para um dos estudos desta tese.

Nos parágrafos seguintes, apresentamos uma breve descrição dos objectivos, métodos e resultados de cada estudo realizado.

Estudo I

Pretendemos mapear a evidência existente acerca das estratégias para medir IPV em homens e mulheres. Para atingir este objectivo conduzimos uma revisão de escopo da literatura. Procuramos nas bases electrónicas Pubmed®, ISI Web of Knowledge® e Scopus® desde a primeira indexação até 2014 e a informação extraída incluiu o tipo de instrumento utilizado, amostras, estimativas de prevalência, dados psicométricos, ano e região das publicações.

No total, foram analisados 1098 estudos. A estratégia mais comummente seguida e utilizada em todo o mundo para avaliar IPV, foi a criação de perguntas específicas (30.3%). Esta foi a opção preferida encontrada nos estudos com as maiores amostras e com amostras comunitárias. Relativamente a instrumentos estandardizados, a Conflict Tactics Scales (CTS) foi a escolha mais frequente, enquanto para amostras clínicas, a ferramenta preferida foi o Abuse Assessment Screen (AAS). As estimativas de prevalência foram geralmente mais elevadas quando as versões originais da CTS foram utilizadas. Esta revisão mostrou um predomínio de estudos oriundos da América do Norte, o que representou mais de 50% das publicações analisadas.

Estudo II

Nesta nota metodológica descrevemos o desenho, métodos, procedimentos e características da população envolvida num estudo multicêntrico desenhado para comparar IPV em oito países.

Os cadernos eleitorais, registos municipais, rota aleatória e aleatorização de dígitos telefónicos foram utilizados para a amostragem de mulheres e homens com idades entre os 18 e 64 anos, vivendo em Estugarda-Alemanha (n=546), Ghent-Bélgica (n=245), Granada-Espanha (n=138), Atenas-Grécia (n=548), Budapeste-Hungria (n=604), Porto-Portugal (n=635), Londres-Reino Unido (n=571) e Östersund-Suécia (n=592). Três métodos foram utilizados para administrar diferentes secções de um questionário comum: autopreenchimento (IPV), entrevista face-a-face (dados demográficos e de saúde) e por correio. Foram calculadas fracções populacionais em cinco estratos de idade e por sexo e educação, e foram utilizadas razões de fracções populacionais para avaliar a representatividade das amostras.

Foram encontradas diferenças na distribuição por idade nas mulheres da Suécia e Portugal e nos homens da Bélgica, Hungria, Portugal e Suécia.
Foi obtido um sobre-recrutamento de participantes mais escolarizados em todos os locais.

Estudo III

Pretendemos avaliar quatro tipos de IPV em homens e mulheres adultos da população geral de seis centros urbanos Europeus distintos (Atenas, Budapest, Estugarda, Londres, Östersund e Porto).
Os tipos de IPV foram medidos com a Revised Conflict Tactics Scales (CTS2). Diferenças de sexo e idade na prevalência no último ano foram examinadas considerando vítimas, agressores ou ambos e considerando a severidade e repetição dos actos violentos.
As vítimas de agressão psicológica do sexo masculino variaram de 48.8% (Porto) a 71.8% (Atenas) e as vítimas do sexo feminino de 46.4% (Budapeste) a 70.5% (Atenas). Homens e mulheres vítimas de coerção sexual variaram de 5.4% e 8.9%, respectivamente em Budapeste, a 27.1% e 25.3% em Estugarda. Homens e mulheres vítimas de agressão física variaram de 9.7% e 8.5% respectivamente no Porto, a 31.2% e 23.1% em Atenas. Homens vítimas de lesões foram 2.7% em Östersund e 6.3% em Londres e mulheres vítimas foram 1.4% em Östersund e 8.5% em Estugarda. A prevalência da violência na relação íntima diferiu significativamente de acordo com as cidades. Homens e mulheres vivenciaram IPV predominantemente enquanto vítimas e agressores em simultâneo e poucas diferenças de sexo foram observadas em cada cidade.

Estudo IV

Explorámos a associação entre a posição socioeconómica (SEP) e IPV considerando as perspectivas de homens e mulheres enquanto vítimas, agressores e ambos (bidireccional).
No total, 3496 adultos (18-64 anos) foram aleatoriamente seleccionados da população geral residente em Atenas, Budapeste, Estugarda, Londres, Östersund e Porto. A violência física foi medida com o CTS2. A escolaridade (primária, secundária e universitária), ocupação (profissões de colarinho branco superior, colarinho branco inferior e colarinho azul) e a duração do desemprego (nunca, ≤12 meses e >12 meses) foram considerados enquanto indicadores de SEP. Foram utilizados modelos de regressão logística e calculados odds ratios, respectivos intervalos de confiança a 95% (OR, IC95%) ajustados para idade e cidade.

Violência física no último ano foi reportada por 17.7% das mulheres (3.5% vítimas, 4.2% agressoras e 10.0% bidireccional) e por 19.8% dos homens (4.1% vítimas, 3.8% agressores e 11.9% bidireccional).

Nas mulheres, um nível de escolaridade baixo (primário vs. universitário) associou-se com a vitimização (OR, IC95%: 3.0, 1.2-7.5) e com violência bidireccional (4.1, 2.4-7.1). Uma profissão de colarinho azul (vs. colarinho branco superior) nas mulheres associou-se com vitimização (2.1, 1.0-4.5), agressão (3.1, 1.4-6.8) e violência bidireccional (3.9, 2.3-6.8). A duração do desemprego associou-se com a perpetração masculina (OR, IC95% em agressores com >12 meses de desemprego vs. nunca ter estado desempregado: 3.4, 1.5-7.7) e com a violência bidireccional em ambos os sexos (mulheres: 1.8, 1.2-2.8; homens: 1.7, 1.0-2.8).

Estudo V

Avaliámos a HRQoL na presença de violência física e sexual, tendo em conta o sexo e a direccionalidade dos actos.

Homens e mulheres adultos (n=3496), aleatoriamente seleccionados da população geral de seis cidades Europeias foram avaliados com recurso ao CTS2 e ao Medical-Outcomes-Study 36-item Short-Form Health Survey (SF-36). As pontuações médias [erro padrão] obtidas nas escalas sumárias de saúde física e mental do SF-36 para vítimas, agressores, casos de violência bidireccional e para aqueles que não estiveram envolvidos em violência física e/ou sexual no último ano foram comparadas utilizando modelos de regressão linear ajustados para a idade, educação e cidade.

Verificamos que a dimensão de saúde física da HRQoL foi significativamente menor em mulheres envolvidas em violência física bidireccional (48.00[0.58]) por comparação com mulheres que não reportaram violência física (49.75[0.26]). Na dimensão de saúde mental, as mulheres envolvidas em violência física (enquanto vítimas, agressoras e ambos) apresentaram pontuações médias significativamente menores do que as mulheres que não declararam violência física. Mulheres apenas vítimas de violência sexual (44.74[0.86]) e as que foram vítimas ou envolvidas concomitantemente em violência física e sexual bidireccional (41.43[2.36] e 43.34[1.30], respectivamente), também apresentaram menores pontuações médias para a saúde mental. Nos homens, pontuações médias significativamente menores na saúde mental foram observadas no grupo envolvido em violência física bidireccional (46.34[0.78]) e no grupo envolvido em ambos os tipos de violência física e sexual bidireccionais (46.17[1.30]).

Estudo VI

Avaliámos as características organizacionais dos serviços prestadores de cuidados de saúde mental para grupos marginalizados em capitais Europeias e explorámos as associações existentes entre a qualidade organizacional, características dos serviços e características ao nível do país.

No total, 617 serviços foram avaliados em duas áreas altamente excluídas de 14 capitais Europeias. Foi desenvolvido um Índice da Qualidade de Organização do Serviço (QISO) e aplicado em todos os locais. As características dos serviços e indicadores socioeconómicos ao nível do país foram testados e relacionados com o Índice utilizando regressão linear e modelos lineares de coeficiente aleatório.

A média (desvio padrão) da pontuação QISO (mínimo=0; máximo=15) variou de 8.63 (2.23) na Irlanda a 12.40 (2.07) na Hungria. O número de programas diferentes fornecidos foi a única característica dos serviços significativamente correlacionada com o QISO ($p<0.05$). O Produto Interno Bruto nacional (GDP) associou-se inversamente com o QISO. Cerca de 15% da variância no QISO foi atribuída a variáveis ao nível do país, em que o GDP explicou 12% desta variância.

Estudo VII

Numa amostra de mulheres e homens adultos (18-64 anos) Europeus examinamos a relação entre cuidados de saúde adiados ou protelados e o envolvimento em IPV enquanto vítimas, agressores ou ambos (bidireccional ou recíproca).

Avaliaram-se 3496 sujeitos aleatoriamente amostrados da população não-institucionalizada de seis cidades Europeias (Atenas, Budapest, Estugarda, Londres, Östersund e Porto). Mediu-se IPV com o CTS2 e os cuidados de saúde protelados com a questão “Durante o último ano, necessitou de algum cuidado de saúde, mas não procurou ajuda?”.

Para medir a associação entre cuidados de saúde protelados e IPV, utilizou-se o teste do Qui-quadrado para análise bivariada e calcularam-se odds ratios e intervalos de confiança a 95% (OR, IC95%) utilizando-se modelos de regressão logística e considerando potenciais confundidores.

Os participantes envolvidos em alguma IPV reportaram mais frequentemente protelar cuidados de saúde quando comparados com os que não estiveram envolvidos em violência (18.6% vs. 15.3%, $p=0.016$).Ter reportado vitimização e agressão (bidireccional) de qualquer acto de violência associou-se com cuidados de saúde protelados, independentemente de ter alguma doença crónica, a auto-percepção do estado de saúde ou ter sentido tensão financeira (OR, IC95%=1.41, 1.10-1.81). Uma associação de magnitude semelhante foi observada entre vítimas, contudo, não foi estatisticamente significativa (1.35, 0.89-2.04).

As principais conclusões destes estudos podem ser sumariadas da seguinte forma:

Existem tendências na escolha por um instrumento particular de medição de IPV, de acordo com o método de administração e local de aplicação. A prática clínica e a investigação são negativamente afectadas pela falta de uma avaliação exaustiva dos instrumentos existentes para a detecção de IPV sendo, portanto, necessários estudos que repliquem as associações entre violência e resultados em saúde utilizando medidas de exposição similares.

Para a condução de um estudo multicêntrico sobre IPV, existem vários desafios éticos e logísticos que têm de ser ultrapassados. As limitações ao estabelecimento de amostras probabilísticas e a utilização de diferentes métodos de administração constituem explicações plausíveis para as diferenças demográficas encontradas entre locais na realização de trabalhos deste tipo. Contudo, através da utilização de um protocolo de investigação comum, com o mesmo questionário estruturado, é possível obter estimativas precisas da frequência de IPV na população geral.

Na população geral de adultos residentes em Atenas, Budapeste, Estugarda, Londres, Östersund e Porto, a prevalência nos últimos 12 meses de violência psicológica, física, sexual e lesões, enquanto formas de IPV, varia significativamente, apesar de poucas diferenças de sexo serem observadas em cada cidade. A maioria da violência é bidireccional ou recíproca, i.e., a maioria dos sujeitos declaram ter sido simultaneamente vítimas e agressores de actos de violência na sua relação íntima.

Além disso, a violência física está associada a uma posição socioeconómica desvantajosa e a violência física e sexual influenciam negativamente a HRQoL, notando-se pontuações menores na componente de saúde mental em mulheres vítimas e em homens e mulheres envolvidos em violência bidireccional. Estes dados apoiam a necessidade de serem consideradas as perspectivas de vítimas e agressores de ambos os sexos.

Tomando a perspectiva da prestação de cuidados de saúde, os factores socioeconómicos contextuais, particularmente o Produto Interno Bruto nacional, podem influenciar a qualidade organizacional dos serviços prestadores de cuidados de saúde mental para grupos socialmente marginalizados ou vulneráveis. Também a influência da violência nos cuidados de saúde protelados ou adiados enfatiza a importância de se considerar a IPV entre as barreiras no acesso aos cuidados de saúde.

1. Introduction

The introductory chapter of this thesis is organized as follows:
In the first section a brief overview of major events leading violence to be considered a public health issue is provided and, resorting to a typology proposed by the World Health Organization (WHO), we define what is meant by intimate partner violence.

The second section presents a brief description of the theories that have framed IPV research, starting by sociological and psychological concepts sharing the principle that IPV is a male enterprise. An emphasis is then placed in the ecological model supported by the WHO encompassing a multidisciplinary view for the understanding of violence. Admitting that violent behavior' determinants can be found at the individual, relationship, community and country or societal-level, this model fulfills the requisites of a public health approach. Furthermore, by contextualizing regional differences found in IPV, the ecological model fits the perspective taken throughout this thesis.

In the third section we describe the magnitude of IPV in the world. One of the first steps of a public health approach to any given problem is to exhaustively describe the most basic knowledge starting through systematic collecting data on the problems' magnitude. We resorted to the most recent and comprehensive epidemiological population-based information available documenting the magnitude of IPV worldwide. Starting by the prevalence of IPV against women, we proceed to the results of prevalence studies assessing violence in men and in both genders. A focus is then placed on the European region, with a review of studies documenting IPV prevalence against women and in both genders.

In the fourth section of the introduction we present arguments for the associations explored in this work. Violence victims have poorer health and violent behavior is associated with poverty and commonly found amongst the most vulnerable groups of society. But socioeconomic indicators used to inform inequalities in the experience of IPV vary widely and the study of the mental health consequences of violence seldom considers the experiences of men or considers the effect of having been both a victim and a perpetrator. We finalize arguing on the need to reflect in the role of healthcare for the most vulnerable and also, more specifically, for those experiencing IPV.

The fifth and final section is dedicated to methodological and ethical aspects of IPV research. How is IPV measured? What to expect from different methodological choices? How to keep respondents safe? Despite the existence of standardized measurement instruments,

researchers and clinicians must rely on self-reports of violent behavior which is a very sensitive and private experience. To securely and accurately elicit disclosure is, therefore, of utmost importance, and must comply with several ethical principles.

1.1. Intimate partner violence as a public health concern

The forty-ninth World Health Assembly (1) held in Geneva in 1996 declared violence as a leading worldwide public health problem. Such recognition helped to trigger a continuing growth in understanding violence of all forms and in the development of efficient strategies to reduce it (2).

The success in treatment and prevention of infectious diseases in most of the high-income countries results from effective interventions that rose from public health approaches (3). Other causes of death emerged as public health concerns, with homicide and suicide rates evidencing the need to address violence and violent behaviour through the same strategies, effectively and firmly grounded in scientific evidence, that keep producing benefits in the population health and well-being (4).

The scientific evidence made violence a recognised target for public health by showing it is not associated with healthy individuals or families (5). Also, violent behaviour is part of the cluster of factors that characterize the most vulnerable groups of the population (6), thus a target for the continuous combat to reduce health inequalities. Furthermore, at least two core beliefs substantiate such public health approach: that violence and its associated factors are preventable and that through the application of the principals of epidemiological research to violence, significant improvement might be achieved in the population health if the contribution of violence to death, disability and injury is reduced (7).

However, the establishment of an objective definition of which type of acts and behaviours are considered violence has been proved challenging (8). Homicide and suicide are objective indicators, but a clear consensus among scholars, non-governmental and governmental organizations on other forms of interpersonal violence has been hindered by differing cultural values, distinct norms of acceptability or tolerance towards violence (9, 10), and the use of different terminologies (11-13). Acknowledging such difficulties, the 2002 WHO Report on Violence and Health (14) advanced a comprehensive definition that accounts for the nature of violent acts (physical, sexual, psychological, deprivation, neglect) and the receiver of the act (Figure 1).

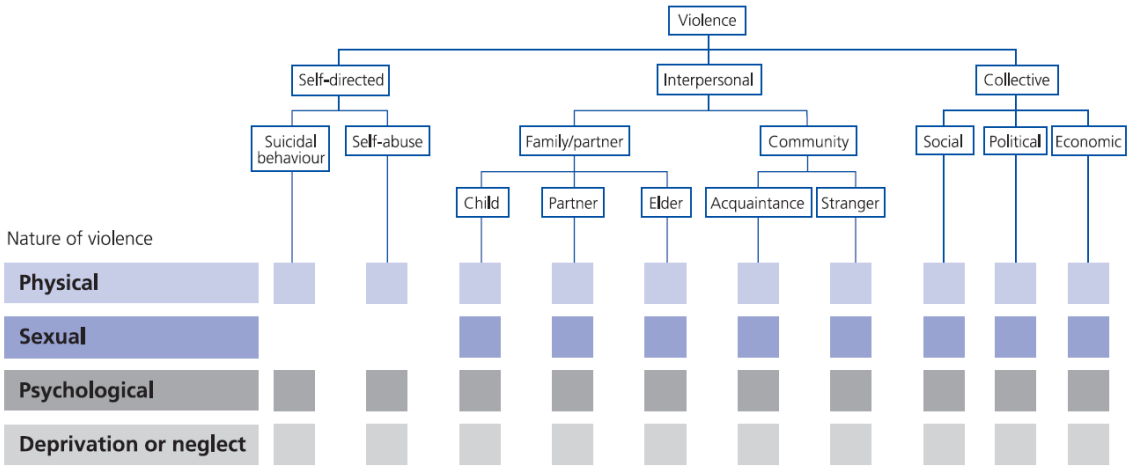

Figure 1. World Health Organization typology of violence (WHO - World Report on Violence and Health, 2002)

The WHO operationalizes intimate partner violence (IPV), as any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship, such as slapping, hitting, kicking and beating (physical aggression), intimidating, humiliating (psychological), forced intercourse or other forms of sexual coercion (sexual), isolating a person from family and friends or restricting their access to information (controlling behaviours)(14). It has been addressed through different disciplinary lens and continuously evidenced as one of the most pervasive types of violence over the developed and developing countries (15, 16), a result of its multiple dimensions and facilitating contextual conditions (17), yet underexplored.

The importance of IPV for health policies and planning is highlighted in the 2010 Global Burden of Disease (GBD) report (18), which ranks it 16th in the list of risk factors for Disability Adjusted Life Years (DALY) globally (Figure 2) and this position climbs to 13th when considering developed countries.

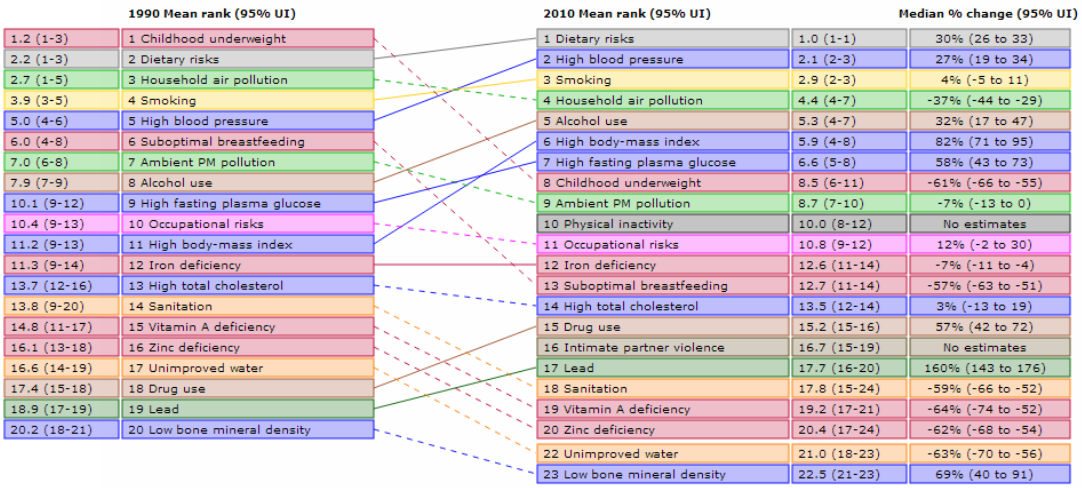

Figure 2. Global Burden of Disease estimates in DALYs attributable to leading risk factors globally, 1990-2010 (ihmeuw.org/gbdarrowdiagram).

Despite well-established and continuously updated evidence on the magnitude and health consequences of IPV against women (16, 19, 20), methodological difficulties of research are paramount (21). This is particularly the case when dealing with cross-cultural comparisons. The use of different questions or assessment instruments and administration procedures or the use of criminal and clinical samples (22), rather than large community samples to inform interventions, still hinders a true population-based approach.

There is a need for contextualized and methodologically comparable assessments to guide and improve large-scale interventions. This is further emphasized by the geographical variation observed in prevalence estimates (23), attesting the universal, unresolved character and prevention potential of IPV.

1.2. Theoretical frameworks: how to explain intimate partner violence

Given the multidisciplinary interest, several theories have been developed to provide a conceptual understanding of IPV, although complete empirical support is still needed (24).

One of the most cited theoretical framework derives from examining the sociocultural context in which violence occurs. It encompasses a feminist view where gender inequality within patriarchal societies is the main cause of IPV (25). Socially defined gender roles place men in positions of power over women, leading to perpetration of violence against women by men who use various tactics to exert dominance and control, including physical violence (26, 27). Any power imbalance perceived in the relationship increases the risk of male perpetration (28). Embedded by this framework, a classification of violence episodes occurring between heterosexual intimate partners has been proposed, being one of the most influential theories in the field. It is based on the frequency and severity of controlling behaviours and tries to explain why different sex-ratios are obtained when examining IPV in different types of samples (29-32). According to this theory, episodes of violence observed in representative samples of the general population or adolescent couples, were termed as “common couple violence” or “situational couple violence” (29), as they would be the product of less-gendered causal processes, involving conflict that occasionally got “out of hand”. This type of interaction would lead to minor forms of violence that could rarely escalate to more severe forms. In the case of studies mainly focused on violence against women, samples are typically derived from women victim’s aid-shelters or refuges, or from treatment samples of violent men, law enforcement agencies or hospitals. Violent behaviours identified in such settings would be much more “serious” in terms of their consequences, and would be a product of patriarchal traditions of men’s right to control their women. This would involve not only a systematic use of violence, but also other forms of “terrorism” control tactics, like economic subordination, threats and isolation. This form has been called “patriarchal terrorism” or “intimate terrorism” (29). The theory was further expanded to include two more subtypes: “violent resistance” and “mutual violent control” (33). Violent resistance describes relationships where women use violence against men who are violent and controlling towards them, therefore, a self-defensive type of violence. Mutual violent control is hypothesised to be gender symmetric, describing relationships where both partners are equally violent and controlling.

A number of studies have tried to explore the presence of these profiles in samples of the general population, and show that violence and control might be more gender-symmetric than initially thought (34-36).

Violent behaviour has also been thought to be modelled or socially learned (27), although empirical evidence testing an intergenerational pattern has not been fully supportive (37).

Another set of theoretical approaches have tried to identify psychopathology and personality characteristics that may increase a person's susceptibility to perpetrating IPV, fitting in a general aggression model (38), and finding support in studies showing a high frequency of certain psychiatric diagnosis among perpetrators (39).

Other theories derive from framing violent behaviour and its social functions in an evolutionary perspective (40). Violence emerges amongst several other tactics for solving basic evolutionary problems, namely conflicts between the evolutionary interests of individuals of the two sexes. In this framework, males share a sexual proprietariness feature and, basically, use IPV to limit female autonomy and retain control in several conflicting situations, such as in the case of sexual infidelity or resource scarcity (41).

Finally, an ecological framework of understanding, thought to better accommodate the complexity and multiplicity of theories concerning interpersonal violence has been proposed and explored (42, 43). This framework relates individual, relational, community and societal factors and provides a broader range of analysis, thus demanding multidisciplinary thinking. Such ecological modelling rose in the scope of the public health approach invoked by numerous international conventions and organisms.

1.2.1. The ecological perspective

To meet the terms of a public health approach, the key factors that trigger the problem must be explored, contextualized and tested to inform which interventions might maximize benefits, after definitional consensus and population quantification establishment (3).

In the case of IPV the search for such triggers or determinants has resulted in the acceptance of a multi-level and multi-causal framework for its understanding, analogous to the complexity of the phenomenon of IPV itself.

Derived from Bronfenbrenner’s ecology of human development (44), an ecological model is often used to understand how the wide range of factors involving individuals, their relationships, and the communities and societies in which they live, interact to increase or reduce vulnerability to violence (43) (Figure 5). The model, conceived as a nested arrangement of structures or system levels, each contained within the next, places individual factors, namely the personal history that each individual has, as the most proximal factors affecting his/her behaviour and relationship. This level includes factors such as witnessing parental violence, personality traits or substance abuse. The relationship level, consubstantiate the features of the immediate context in which abuse takes place, and includes, for example, the level of control of wealth one partner has over the other. The community level encompasses the characteristics of the close settings where violence

happens, that may increase its occurrence, such as poverty or unemployment. At the societal level, the model places cultural or social norms (both formal and informal) that influence a broader acceptance or prohibition of violent behaviour (42, 43).

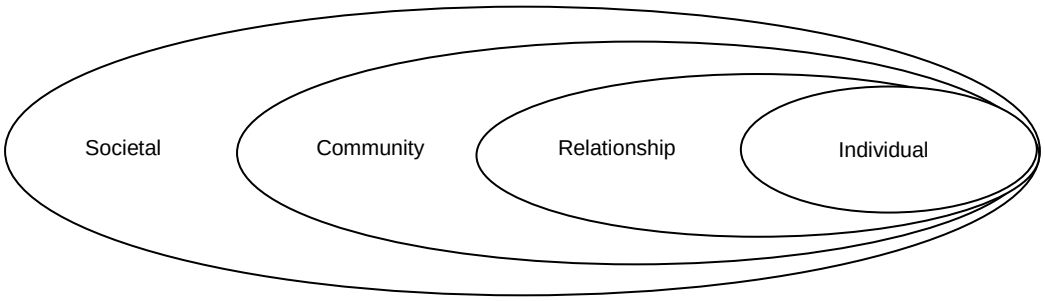

Figure 3. Ecological model for understanding violence (WHO - World Report on Violence and Health, 2002)

This multidimensional approach, helped to reconcile several unrelated lines of research, providing a multidisciplinary framework that integrates common findings related to violence, namely IPV against women and emphasizing the need to focus on multi- rather than uni-causality of violence. By combining individual-level risk factors with findings of cross-cultural studies, the ecological model has been useful to understand why some men are more violent than others within and between different countries and regions. However, the framework includes only those factors shown empirically related to differential rates of violence against women and girls (45). Research is still needed to test the causal or correlational nature of several identified factors and their generalizability to male victimization, since causation is still weak according to epidemiological criteria.

1.3. The worldwide prevalence of intimate partner violence

From the 1970's onwards, a feminist movement has greatly contributed to the achievement of gender egalitarianism in all areas of life, including raising awareness to violence occurring against women in the scope of their intimate relationships. The conceptualization of IPV as essentially male enterprise (46) has resulted in a majority of studies focusing female victims at the hands of their male partners.

According to the United Nations, at least one national survey on violence against women has been conducted in more than 70 countries (47), although many are not meaningfully comparable.

The statistics derived from clinical or criminal sources, are thought to represent the "tip of the iceberg" (48) of a more widespread phenomenon. An analysis of the reporting behaviors of women who survived physical or sexual violence at the hands of intimate partners or others as measured by the violence module of the Demographic and Health Surveys (DHS) performed in 24 countries shows that only 7% reported to a formal source (varying from 2% in India and East Asia to 14% in Latin America and the Caribbean) (48). Clinical studies, meaning studies where participants are identified in healthcare facilities of different kinds, have revealed prevalence estimates ranging from 1% to 20% in pregnant women (49), and of 30% for psychiatric patients (50).

Studies using samples drawn from the general population are difficult to compare due to the methodological specificities of each evaluation. Assuming probabilistic sampling procedures are common to all population-based studies, the fact remains that few studies employ consistent definitions or allow to measure the occurrence of different types of violence, much less their occurrence across age, sex and other demographic categories.

The findings integrated in the 2002 WHO Report on Violence and Health (14) summarizing the results of 48 population-based studies documenting IPV against women, referred that between 10% and 69% of women reported being physically assaulted by an intimate male partner at some point in their lives, with past year estimates ranging from 3% in Australia, Canada and the United States, to 52% in Palestinian women in the West Bank and Gaza Strip.

In 2013, the WHO published, probably the most comprehensive systematic review on the global prevalence of violence against women searching 26 databases and consulting four large multi-country studies for published evidence (15). These included the WHO Multi-country Study on Women's Health and Domestic Violence, the International Violence Against Women Surveys (IVAWS), the Gender, Culture and Alcohol: An International Study, and the

Demographic and Health Surveys (15). The results show that almost one third of all women who have been in a relationship have experienced physical and/or sexual violence by their intimate partner, with proportions varying from 23% in high income countries to 37% in the WHO South-East Asia region (16) (Figure 3).

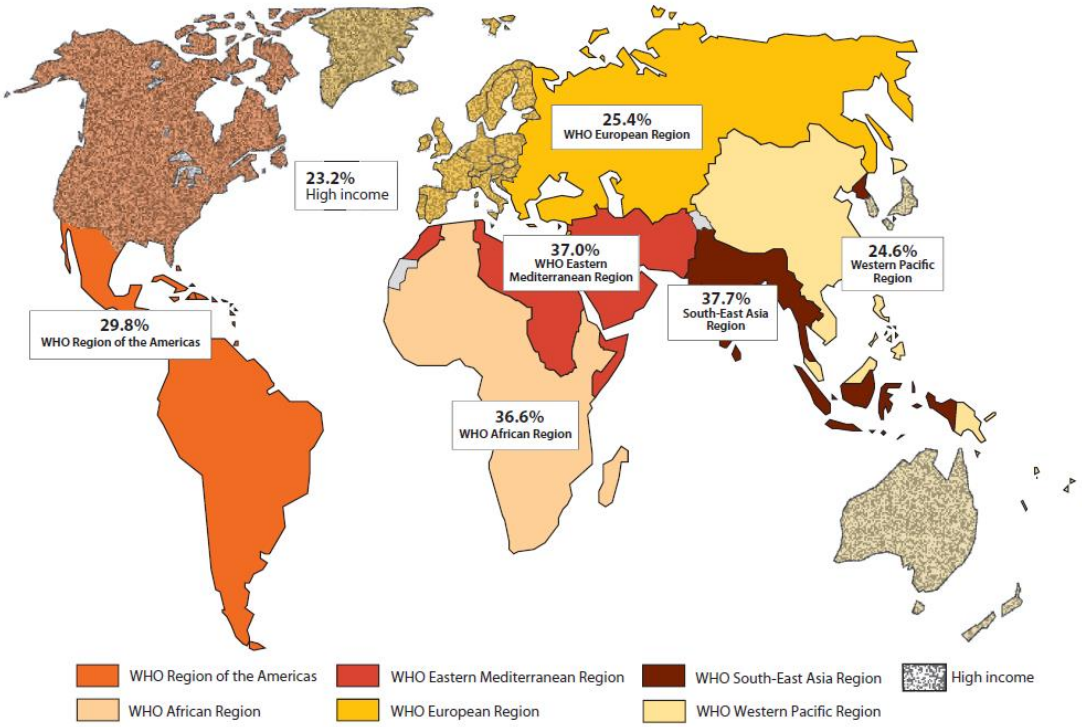

Figure 4. Global map showing regional prevalence rates of intimate partner violence by WHO region (2010) – Regional prevalence rates are presented for each WHO region including low- and middle-income countries, with high income countries analyzed separately (WHO, 2013)

Studies measuring IPV exclusively on samples of men have been conducted essentially to inform male perpetration rates in heterosexual relationships (51) or victimization rates observed among homosexual or bisexual men (52-54). Studies using clinical samples or assessing other specific groups have focused essentially on sexual violence experienced by men (55, 56) and also show a great heterogeneity in the measures used (57-59).

Population-based information documenting solely on male victimization in heterosexual relationships is scarce and has been mainly conducted in the USA (60). A retrospective telephone cohort study conducted from 2003 to 2005 assessing IPV through the Behavioral Risk Factor Surveillance System Survey (BRFSS) IPV module (61), found a prevalence of 18% for lifetime physical IPV male victimization and less than 1% for lifetime sexual IPV (60).

The first nationally-representative epidemiological study on IPV that included both genders was performed in the USA and dates back to 1976 (62). Ever since, multiple national studies have been repeated in the USA documenting IPV prevalence rates, either as part of crime surveys (National Violence Against Women Survey, National Crime Victimization Study, National Crime Survey), family conflict studies (National Family Violence Survey) (22) or as initiatives of the Centre for Disease of Control and Prevention (CDC) (61, 63). Overall, crime surveys have uniformly found gender asymmetry in rates, with women being the primary victims, whereas family conflict studies find equally high rates on both genders (22).

Although largely influenced by studies performed in the USA, systematic summaries of evidence published on physical IPV in men and women in heterosexual relationships suggest past year prevalence estimates of 23% in women and 19% in men considering the perspective of victims (64) and of 28% in women and 22% in men considering perpetration reports (65). The latter goes in line with a previous meta-analysis suggesting that women are slightly more likely than men to use one or more act of physical aggression and to use such acts more frequently, although men were more likely to inflict an injury (66).

1.3.1. European studies on intimate partner violence

Although using different methods of questionnaires administration, the International Violence Against Women Surveys (IVAWS) (67) is the only multicentre study specifically designed for measuring violence that provides estimates of physical and sexual IPV against women for the highest number of European countries and that used a common protocol. It was conducted between 2003 and 2007 in Czech Republic, Denmark, Italy, Poland and Switzerland showing lifetime estimates of physical IPV that range from 9% in Switzerland to 35% in Czech Republic (Figure 5).

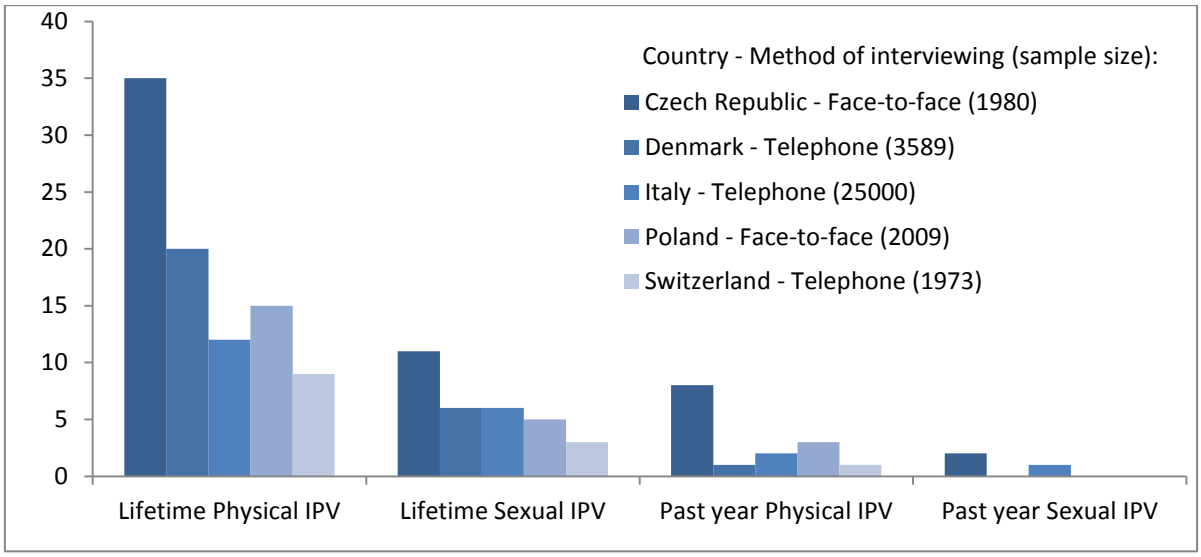

Figure 5. Prevalence estimates for lifetime and past year physical and sexual intimate partner violence (IPV) against women as observed in the European countries participating in the International Violence Against Women Surveys (IVAWS, 2008).

National studies on IPV against women have also been conducted in several European countries, either resorting to questions embedded in national health surveys (68-71) or exclusively designed to measure IPV (72-79). These are also marked by a great heterogeneity in terms of design and methodological choices, including the type and period of IPV assessment, staff training and questions wording, hampering comparisons between countries. Nevertheless, prevalence estimates of physical and sexual IPV against women across Europe reinforce large cross-country variations (Table 1).

Table 1. National studies on intimate partner violence victimization against women from the general population conducted in Europe

Author, year	Country	Sample size	Method of administration	Instrument	IPV type: Prevalence
Vives-Cases, C. et al. 2011	Spain	13094	Self-administered	Study specific	**Any IPV:** Past year: 0.98%
Heiskanen, M. & Piispa, M. 1998	Finland	4955	Postal survey	Study-specific	**Any IPV:** Lifetime: 40% Past year: 14%
Jaspard, M. et al. 2000	France	6970	Telephone survey	Study-specific	**Physical IPV:** Past-year: 2.5%
Neroein, AI. & Schei, B. 2008	Norway	2407	Postal survey	Adapted from two Nordic national studies (Finland* and Sweden)	**Any IPV:** Lifetime: 26.8% Past year: 5.5%
Stöck, H. & Heise, L. 2011	Germany	3866	Face-to-face and self-administered	Modified Conflict Tactics Scales	**Any IPV:** Past year: 17%
Barret, B.O. et al. 2012	Ukraine	2423	Face-to-face	DHS** module	**Physical IPV:** Lifetime: 13% **Sexual IPV:** Lifetime: 3%
Svavarsdottir, E.K. & Orlygsdottir, B. 2009	Iceland	2746	Postal survey	Women Abuse Screening Tool	**Physical IPV:** Lifetime: 2.3% **Sexual IPV:** Lifetime: 1.2%
Burazeri, G. et al. 2005	Albania	1039	Face-to-face	Study-specific	**Physical IPV:** Past-year: 37.0%
Waltermaurer, E. et al. 2013	Georgia	4302	Face-to-face	Modified Conflict Tactics Scales	**Any IPV:** Past-year: 1.6%

IPV- Intimate partner violence; Study-specific – questions specifically chosen by investigators, not referring to any established tool; * Heiskanen, M. & Piispa, M. 1998; **Demographic and Health Survey

European nation-wide studies taking into account IPV victims of both genders can be found at least in the United Kingdom (UK) (80), Sweden (73, 74), and Denmark (68) (Table 2). In the UK, the latest British Crime Survey (BCS) revealed a lifetime prevalence of physical IPV victimization in men of 7% and of 17% in women, whereas past year estimates of physical IPV were 1% in men and 2% in women (80). The studies conducted in Sweden and Denmark show an overall sex symmetry in victimization rates of past year physical IPV with figures being respectively 8% and 5% in women from these countries and 8% and 6% in men (68, 73, 74).

Table 2. National studies on intimate partner violence victimization using samples of men and women from the general population conducted in Europe

				IPV prevalence estimates	
Author, year	**Country**	**Sample size**	**Method of administration**	**Men**	**Women**
Khalifeh, H. et al. 2013	England*	21226	Computer-assisted self-interviews	**Physical IPV**: Lifetime: 7.0% Past year: 1.3% **Sexual IPV:** Lifetime: 0.5% Past year: 0.1%	**Physical IPV:** Lifetime: 16.8% Past year: 2.0% **Sexual IPV**: Lifetime: 4.3% Past year: 0.4%
Nybergh, L. et al. 2013	Sweden	972	Postal questionnaires	**Physical IPV:** Past year: 7.6% **Sexual IPV:** Past year: 2.3%	**Physical IPV:** Past year: 8.1% **Sexual IPV:** Past year: 3.0%
Lövestad, S. & Krantz, G. 2012	Sweden	424	Postal questionnaires	**Physical IPV:** Past year: 11.0% **Sexual IPV:** Past year: 0.6%	**Physical IPV:** Past year: 8.0% **Sexual IPV:** Past year: 3.2%
Sorensen, J. et al. 2012	Denmark**	5202	Self-administered	**Physical IPV:** Past year: 6.4%	**Physical IPV:** Past year: 5.0%

IPV – Intimate partner violence; *Results from the 2008 British Crime Survey; **Results from the 2005 Danish National Health Interview Survey

Apart from the International Dating Violence Study (81) performed in college student samples from 32 different countries, and the Elder abuse: multinational prevalence survey study (ABUEL) (82), performed in community samples of elderly (aged 60-85) from seven European cities, there are no previous multicenter studies documenting IPV victimization or perpetration in both men and women sampled from the European general population.

1.4. Violence and vulnerability

Vulnerable, disadvantaged or marginalized groups of the population typically experience clusters of risk factors leading to poor physical, psychological or social health (83, 84). Health inequalities are magnified in these groups leading them to experiencing conditions and processes that result in a disproportionate burden of ill health and social suffering (85). In 2011 the European Parliament adopted a resolution on “Reducing health inequalities in the EU” in which Member States are urged to focus on the needs of vulnerable groups (86). The WHO has also established that one of the most efficient ways of “closing the equity gap” within a population is to address the health and healthcare of those most vulnerable (87).

Together with a disadvantaged socioeconomic condition, ethnic or racial minority background, immigration, refugee status, homelessness, and other forms of social exclusion (88), violence is part of the cluster of risk factors that characterizes vulnerable or marginalized groups (89, 90).

More specifically, poverty and low education have been associated with IPV, at the individual (80), and at the community and societal levels (91). It is generally accepted that violence tends to be more common in societies socioeconomically more unequal (92). But individual and area-level studies have also presented mixed results (93), with the strength and direction of association varying by site, sex and indicator used (94). Furthermore, inequalities within couples (45) have not consistently predicted IPV, namely against women (95). Socioeconomically empowered women, may have the resources to leave violent relationships (96), but higher-level factors, such as patriarchal norms of violence acceptance of societies, seem to influence the role of individual socioeconomic factors on IPV (9, 97, 98). Also, the impact of the macro-economic environment may differ according to the type of violence (91).

Regarding adverse health effects associated with experiences of violence, the list of physical health consequences associated with female victimization is vast and includes severe headaches, pain, arthritis, coronary heart disease, digestive disorders (5, 76, 99-101), reproductive health consequences such as increased risk of sexually transmitted infections, low birth weight, preterm delivery (102) and termination of pregnancy (20). Mental health symptoms such as depression and anxiety are augmented (103) and the risk of suicide is increased among women victims of IPV (19). Less evidence exists documenting the effects of IPV experiences on men’s health. In general, sex comparisons of the impact of violence victimization in health point to an increased burden in women (104, 105). Nevertheless, a lower quality of life has been identified in male victims of physical IPV (60, 68, 106), and

male perpetration has also been associated with several mental health problems, including depressive symptoms, generalized anxiety disorder and dysthymia (107).

Mental health outcomes may be more important to monitor for several reasons. First, most violence happening within an intimate relationship do not lead to serious injury or need for hospitalization, thus its impact is likely to be more noticeable in terms of mental health symptoms. Secondly, an increased risk of experiencing violence has been found among those with disabilities and mental illnesses (108). Furthermore, the direction of causation may be reversed, leading people with mental health problems to perpetrate violence more often (109, 110). Finally, the prevalence of mental illness is also greater in the most vulnerable groups of the population (111, 112).

In the 2005 European Commission Green Paper on mental health (113), support for vulnerable groups is considered one of the key aspects to develop for an adequate mental health promotion in European States. Because of their poor and often disabling health status or socially deprived situation, vulnerable groups include those who have many interactions with the health system, and also those who have difficulty accessing the system (114-116). However, healthcare initiatives to reduce the barriers created by vulnerability rarely recognize the common overlap of risk factors, and few studies have examined the combined influences of multiple risks on obtaining needed care from services or the most adequate system of delivery of care. Several problems persist in the healthcare of vulnerable groups, such as services fragmentation, under-resourcing of care, policy and funding environments inadequate to effectively address their particular needs (85). As a result, those with the greatest healthcare needs often receive the least adequate healthcare.

Healthcare access and utilization patterns by vulnerable populations have been described based on the relationships of predisposing (substance abuse, education, age, gender), enabling (income, health insurance, cultural barriers) and need factors (symptoms of mental illnesses, consequences of substance abuse) (117). In the US, this framework has helped to disentangle the role of specific factors by guiding focused research on their impact in selected healthcare providers. It showed, for example, that homeless women, victims of IPV used more often the emergency department than primary care services compared to homeless women not exposed to violence (114). An independent association was also documented in the general US population, with an increased utilization of emergency departments as a consequence of violence experiences, found among female victims (118) and male perpetrators (119). Conversely, it has been shown that the majority of female victims of IPV do not seek for help or care when in need, choosing to postpone, delay or forgone healthcare, probably due to shame, fear and other consequences that may rise from their disclosure (120).

Several professional medical organizations have issued guidelines for the screening of violence against women (121) and the latest update of the US Preventive Services Task Force on this issue recommends that clinicians screen women of childbearing age for IPV, and provide or refer women who screen positive to intervention services. However, they also conclude that the current evidence is insufficient to assess the balance of benefits and harms of screening all elderly or vulnerable adults (physically or mentally dysfunctional) for abuse and neglect (122).

Despite the growing evidence in the benefit of screening and acceptance from patients (123), healthcare workers often fail to identify the cause of vulnerable group's health problems, or respond appropriately when violence is identified.

In Europe, the knowledge needed to develop relevant interventions for vulnerable groups and to sensitively detect and treat people experiencing violence, must come from collaborative, multidisciplinary and focused medical, behavioral and health services research, in order to reach the goals of improving their mental health status and reduce inequalities through prevention.

1.5. Methodological challenges of intimate partner violence research

Intimate partner violence is a widespread phenomenon and, simultaneously, a private event in the lives of those who experience it. The measurement of IPV, regardless of the disciplinary perspective is, therefore, challenging (124) and demands rigorous methodological testing (21).

To estimate the prevalence of any form of violence, researchers agree that methods should consist in direct questioning about experiences of specific acts of violence over a particular period of time, rather than using more open-ended and generic questions (23, 125). The reason lies in the belief that a great disclosure is obtained by not implying any causal or contextual relationship in questioning (126) and avoid more individual, culturally influenced answers or any cognitive appraisal (127), in detriment of missing potentially relevant violent acts that the respondent might have experienced but were not listed in any given instrument. Nevertheless, there is no clear "gold standard" for IPV measurement, and several overlapping instruments have been developed (121, 128-132).

A lack of methodological standardization became more noticed as research on IPV has progressed to include violence of all natures and results were based on reports of victims or perpetrators (either to report victimization as declared by the respondent or to estimate victimization based on perpetration reports and vice-versa) (133, 134).

Furthermore, not replicating the same administration methods, settings and procedures across a variety of independent studies, jeopardizes the generalizability of results (21), and makes it impossible to compare cross-regional estimates.

Face-to-face interviewing has been the preferred method of violence assessment (15). However, recent evidence shows that face-to-face contact might not be the preferred method of assessment of victimized women (135), and an interviewer effect might influence responses (136). Also, an increased disclosure in screening is obtained through other techniques, including computer-assisted self-administration (137) and, in healthcare settings, self-completion might be preferred (121). Also, telephone interviews are generally perceived as more anonymous than face-to-face interviews and provide higher participation rates (138), but this method is also prone to bias, namely if the use of landlines does not cover specific groups of the population (67).

In men, differences between using a self-administered questionnaire or face-to-face interviewing for IPV screening were not found in a US urban primary care clinic (139). However, evidence on the influence of methodological choices has been seldom tested using male samples (140).

There are still controversies on what is the best method of administration for IPV assessment, and the existing systematic reviews (132, 137), assert that definitive conclusions are not yet warranted due to study heterogeneity.

1.5.1. Looking behind closed doors

Systematic direct observation of violent acts between intimate partners is unrealistic. Data on violence experiences depends on the willingness of the individual to disclose. Even criminal IPV data, ultimately, depends on the disclosure of the victim, perpetrator or an observer (e.g. neighbour calling authorities suspecting violence).

The creation of a measure allowing researchers to quantitatively study violence in the early 1970's was considered revolutionary (141, 142): the Conflict Tactics Scales (CTS) derived from a sociological perspective of conflict (143), where violence arises as a mean to solve these conflicts, among other possible tactics, that occur within families.

Many of the methodological concerns of IPV assessment were raised by studies using the CTS (126). Its development and refinement are, therefore, intrinsically linked to the history of IPV research.

Early critics feared that the acts listed in the CTS could not represent adequately all violence phenomena present in intimate relationships (144). However, the instrument received posterior support from qualitative assessments showing that the typical violent acts were included (126). Additionally, other existing instruments, such as the Index of Spouse Abuse (145) or the Abuse Assessment Screen (146), also list specific violent acts that are common to those in the CTS.

The CTS was later revised (147), to include sexual coercion and injury acts and to improve distinction between minor and severe violence besides rephrasing "verbal" to "psychological aggression". Ever since, it has been used in more than 100 investigations and used cross-culturally (148) to measure either the prevalence, severity in terms of injury proneness and the repetition of acts of different types of violence, namely psychological, physical, sexual coercion and physical assault with injury (141). Furthermore, the distinction between minor and severe violence in the CTS parallels the USA legal distinction between a simple assault and an aggravated assault (141). The CTS was also created to allow assessment of victimization and perpetration reports from respondents, although most studies only document one of the perspectives.

Amongst the most relevant cross-cultural research that used items derived, adapted or based on the same tradition of act-specific questioning as the original CTS scales to document victimization prevalence, are the WHO Multi-country Study on Women's Health

and Domestic Violence Against Women (23) and the IVAWS (67), both exclusively dedicated to IPV assessment. Also, the Demographic and Health Surveys although not specifically designed for IPV assessment, include a CTS-based IPV module while aiming to assess more generic health-related conditions (48).

Despite their similarity in IPV assessment questions, namely for physical violence, these large population-based observational studies used different methodological options, which makes cross-cultural comparisons difficult. For example, the DHS and the WHO studies used face-to-face interviews to assess women in their private environment, whereas the IVAWS used either telephone (based on random-digit-dialling or selected from telephone directories) or face-to-face interviews (48, 67, 125).

Moreover, these studies focused exclusively on the reports of women battered at the hands of their partners, not asking about their perpetration. Still, given its widespread use and continuous testing (148), the CTS behavioral or act specific approach will, probably, continue to influence the development of IPV research since important ongoing surveys are using it to assess physical and sexual violent acts (e.g. CDC's National Intimate Partner and Sexual Violence Survey - NISVS) (63).

1.5.2. Ethical principles in intimate partner violence research

All epidemiological studies on human participants should follow the international guidelines established by the Council for International Organization of Medical Sciences (CIOMS) (149). Briefly, the principles outline the respect for individuals, minimizing the risk of causing harm or distress while maximizing benefits of performing research, and ensuring justice through the balance of risks and benefits of research participation.

In the scope of multicenter studies, following these common international principles may be particularly challenging as researchers are bound to national legislation, professional ethical and deontological guidelines, directives and review boards, which may force the adoption of very different procedures even for the most basic tasks of the research process (150). In the particular case of IPV, several countries have legislation criminalizing it (151). However, according to published clinical guidelines (152) and for research purposes, it is generally agreed that participant's autonomy and confidentiality should prevail over mandatory reporting, nevertheless this is part of an unsolved dilemma (153, 154).

Researching IPV poses unique ethical challenges that have been recognized and addressed in specific protocols (155), ensuring that none of the outlined principles are violated.

Harm minimization, issues of safety and confidentiality of participants are central concerns of researchers dealing with violence. It is agreed that frank disclosure of violence will only

happen in a private setting, without the presence of respondent's partners or others. If an abusive partner is present, there may be a risk for re-victimization, which is intolerable (156). But such risk may be present even before any assessment procedure has taken place and expands also to the research team: for instance, an invitation to participate in a study about IPV may trigger violence if an abusive partner interprets that he/she has been accused. This may also happen after assessment, when participants need to disclose to their abusive partners what were they participating in. Thus, efforts for participants' protection encompass all stages of IPV research, from the methodological design, which include the choice of the setting, sampling strategy and invitation procedures, to the data collection process, in-depth training of interviewers, data analysis and reporting of findings (156).

To minimize distress of participation and maximize disclosure, great attention is placed in interviewers or fieldworkers training (157). Training must include empathic, non-judgmental communication skills development and any aspect that allows provision of assistance or referring for participants to other sources of support.

There is also an ethical obligation to maximize benefits for participants and for a wider community (155, 157). This implies the design and application of rigorous methods to test hypothesis and that interpretation of findings is meaningful, so that policies and interventions are developed.

2. Study objectives

In this research we aimed to address intimate partner violence, one of the most pervasive forms of violence experienced by humans, taking a public health perspective. During the design of this thesis, we faced specific methodological questions that motivated a systematic search for IPV measurement options and a description of the steps taken to conduct a multicenter population-based study in European urban centers. We aimed to quantify IPV in adult men and women living in six European cities, considering the reports of victims, perpetrators and of adults reporting both situations. Keeping in mind this three-way mode of IPV involvement (victim, perpetrator, or both), we aimed to explore the existence of a socioeconomic gradient in the reports of male and female IPV and whether an impact in their health-related quality of life could be noticeable.

We then focused in healthcare provision and aimed to measure and explore influences of the quality of service organization on the delivery of mental healthcare to groups of the population experiencing multiple health threats, those considered socially marginalized. Lastly, we aimed to test whether the experience of IPV was associated with the decision to forgone healthcare.

The specific objectives of this thesis were:

- To systematically scope the literature on male and female IPV measurement options describing what are the most frequently used instruments, and how and where are they used;
- To describe the design, methods and characteristics of participants involved in a multicenter study conducted to measure the prevalence of IPV in adults living in eight cities from eight European countries;
- To estimate and compare the prevalence of four IPV types in adult men and women living in six cities from six European countries;
- To explore if sex and victim-perpetrator role affects socioeconomic inequalities in IPV reports, considering different indicators of socioeconomic position;
- To estimate the impact of IPV in health-related quality of life of men and women according to their involvement as victims, perpetrators or both;
- To explore service- and country-level factors associated with the quality of mental healthcare provision for socially marginalized groups throughout Europe;
- To estimate the magnitude of the association between IPV and forgone healthcare.

3. Methods

A description of the methods used in this thesis is provided in this section. First, the procedures taken to scope the literature for IPV measurement tools are detailed. Afterwards, we describe two European multicenter studies that form the basis of the empirical work performed. We start by describing the DOVE project, designed to measure IPV and health-related outcomes in eight European cities. Its description includes the sampling procedures taken at each site and the different ethical recommendations that were upheld and that influenced practical decisions taken during fieldwork. Then we describe the PROMO project, a multicenter study involving 14 European capital cities, designed to assess social and mental healthcare provision for socially marginalized groups. Regarding this project, we briefly define the marginalized groups that were focused, the deprived areas selected in each city for assessment and explain how services were identified and evaluated.

3.1. Scoping review of intimate partner violence instruments

To map the relevant literature describing the measurement of intimate partner violence in adults we conducted a scoping review of published studies, allowing the inclusion of heterogeneous study methodologies. Searches were made through Scopus®, ISI Web of Knowledge® and PubMed® electronic databases from inception to December 2014.

Controlled vocabulary terms specific to PubMed database were used. Terms included were *domestic violence, sex offenses, spouse abuse, intimate partner, aggression, instrument, tool, scale, questionnaire, inventory, population based, community, general population, incidence, prevalence.* The following limits were imposed: studies on Human, adult samples (19-64 years), written in English, French, Italian, Spanish or Portuguese.

A total of 1098 articles were analyzed from 3106 non-duplicated studies identified that assessed IPV in samples of adults.

From each publication, the information collected consisted on relevant methodological aspects of the study design, namely the size and type of samples (clinical, population-based), instrument or questions used for IPV assessment, administration methods, violence directionality assessed (violence against men or women). Whenever available, the prevalence of any type of IPV was also extracted and measures of scales' reliability and validity or any other psychometric analysis were extracted for the 3 most frequently found established tools.

3.2. The DOVE project

The *Domestic violence against women/men in Europe* (DOVE) project consists of a cross-sectional multicentre international study involving institutions from eight European countries [www.doveproject.eu]. The institutions composing the DOVE consortium were: the Institution for Health Sciences, Department of Public Health Sciences and Department of Social Sciences, Mid Sweden University from Sundsvall, Sweden; the Department of Public Health, Protestant University of Applied Sciences Ludwigsburg, from Ludwigsburg, Germany; the Faculty of Health and Social Care Sciences, Kingston University and St George's, University of London from London, United Kingdom; the Institute of Sociology, Hungarian Academy of Sciences from Budapest, Hungary; the Department of Sociology, National School of Public Health Athens from Athens, Greece; the International Centre for Reproductive Health (ICRH), Ghent University from Ghent, Belgium; the Departmental Section of Psychiatry and Psychological Medicine, University of Granada from Granada, Spain and the project was coordinated by the Department of Clinical Epidemiology, Predictive Medicine and Public Health, University of Porto Medical School and the Institute of Public Health – University of Porto.

Besides the description of policies and practices addressing domestic violence implemented in the participating states, the DOVE project aimed to describe the intimate partner violence experiences of adult women and men, living in the urban centres where the consortium members were established, regarding the magnitude, characteristics, determinants and consequences in terms of health and quality of life.

3.2.1. Sampling procedures

The DOVE project targeted the general population aged 18-64 years living in Ghent – Belgium, Stuttgart – Germany, Athens – Greece, Budapest – Hungary, Porto - Portugal, Granada – Spain, Östersund – Sweden and London – United Kingdom. Assuming an expected IPV prevalence of 15% (158) and 3.0% of relative precision, size of samples was determined as 544 (272 women) for each center. Samples were proportionally stratified according to age and sex, based on national Statistics Institutes data for resident population (2008). Non-institutionalized national citizens or documented migrants residing in the participating cities were considered eligible.

Figure 6 shows the sampling strategies used and sample size in each city.

Figure 6. Sampling strategies and samples obtained (n) in each city participating in the DOVE project.

Except in Athens and Budapest where random-route was performed, registries were used as sampling frames, to obtain lists of eligible participants. Municipal registries were consulted in Granada (contact list size was n=2176), Ghent (n=2720) and Stuttgart (n=3077), while the electoral registry was consulted in Porto (n=1990) and London (n=4720) and the state person address registry was consulted in Östersund (n=1996).

Additionally, in Porto, random-digit-dialing (RDD) of city landlines was performed (n=10623 calls) inviting for participation the adult whose birthday was most recent in each household. In London, a via-public approach was also used as a sampling procedure, conducted in selected public settings (number of persons approached was 1280).

In Athens, random route sampling was based on two stages stratification: 1st stage included 4 major strata (regions) of the Greater Municipality Area of Athens and in the 2nd stage the 4 major strata were further stratified in a number of municipalities of geographical proximity and secondarily of similar socioeconomic structure.

In Hungary, a database containing all the street names in the selected Budapest localities was used and the selected streets served as starting points for the interviewers who received pre-numbered questionnaires.

3.2.2. DOVE questionnaire

The assessment tool covered information on socio-demographics, presence of chronic conditions, past year healthcare use, health-related quality of life and intimate partner violence. Standardized scales included available nationally validated versions of the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36) (159) and the Revised Conflict Tactics Scales (CTS2)(141).

After translation, back-translation and revision by an expert panel of all items for which a nationally validated version was not available, the tool was tested in a pilot environment at each center using convenience samples (n=89 total pilot sample).

An interviewer manual was produced and distributed to all teams, covering in-depth training of interviewers and detailing all items in the assessment tool. This manual also included possible scenarios related to introducing the interview, dealing with difficult participants and sensitive situations during the interview, research ethics and safety of participants and researchers during fieldwork including handling of reported or witnessed domestic violence incidents (155).

The psychological abuse (8 items), physical assault (12 items), sexual coercion (7 items) and injury (6 items) subscales of the Revised Conflict Tactics Scales were used to assess victimization, perpetration and bidirectional (or reciprocal) IPV, considering a current or former intimate partner. Ever-partnered included those in a dating, cohabiting or marital relationship that lasted more than one month.

The internal consistency of the CTS2 (Cronbach alpha) in the global sample, was 0.903 for victimization (from 0.825 in Budapest to 0.956 in London) and 0.896 for perpetration (from 0.748 in Östersund to 0.953 in London).

3.2.3. Ethical recommendations

The WHO ethical guidelines for the conduct of research on intimate partner violence (160) were considered by the research team in the study design.

In Porto, the study was approved by the Ethical Committee of Hospital São João, in Ghent by the ethical committee of Ghent University, in Stuttgart by Ethical Committee of the Medical Association of Baden-Württemberg, in Östersund by the Regional Ethics Committee in Umeå, in London by the St George Faculty's Research Ethics Committee and in Budapest by the ethical committee of the Institute of Sociology of the Hungarian Academy of Sciences. In Athens interviews were performed by MARC, SA, a company member of the SEDEA (Association of Greek Market & Opinion Research companies) and ESOMAR (European

Society for Opinion and Marketing Research) thus following SEDEA's Code of Ethics and the International Code of Conduct for the Practice of Market Research and Social Research.
A number of recommendations and specific questions were posed in each center. In Ghent the ethical committee did not recommend interviewing participants at their houses or send them questionnaires through mail, either electronically or posted. Also, they discouraged telephone or online interviewing. Only the agreed upon invitation letter and the informed consent form were encouraged to be sent through post. The Belgium ethical committee also advised that interviews should be conducted in safe places, preferably public, such as a hospital, and that an intervention protocol was provided to interviewers, giving them the possibility to call for assistance of a stand-by help-team for the respondent if needed.
The Ethical committee consulted in Budapest also advised the team to adopt two methods of administration, namely face-to-face interviews for all questions concerning socio-demographic and health characteristics, and self-administration for all violence-related questions. The self-administered part should then be sealed in an envelope and given to the interviewer. This procedure was adopted for face-to-face interviews performed in the remaining centers.
In London, the ethics committee discouraged approaching participants initially by phone or the mailing of questionnaires in the initial contact (along with the invitation letter). Furthermore, the committee did not advised for the researchers to follow up the invitation letter with a phone call. Therefore, they instructed the team to introduce the use of a reply slip (sent with the invitation letter) which would be returned in a pre-paid envelope by those who were interested in finding more about the study or were willing to participate. They also recommended the reimbursement of travel expenses for participants as most of the interviews would take place in public locations.
No further recommendations were given by the ethics committees from the remaining centers.

3.2.4. Data collection and method of administration

Participants selected through registries were sent an invitation letter with a project summary. In Ghent, Porto and Stuttgart, after sending invitation letters, participants received a telephone call to schedule an interview and provide any necessary clarification. In Östersund, all questionnaires were posted with a pre-paid envelope for return. This option was also considered in the other centers, whenever participants where otherwise reluctant. Preferably, face-to-face interviews were performed by trained interviewers, for socio-

demographics and all health-related constructs and self-administration was asked for all questions related to IPV.

Except in Östersund, questionnaires were administered at the participant' home (Athens and Budapest), university premises (Ghent and London) or either places (Porto and Stuttgart). Following the WHO guidelines (155), questionnaires were only administered when privacy was assured.

Although written informed consent was asked to all face-to-face interviewed participants, no link between signed consents and questionnaires existed.

Data collection took approximately 9 months and was completed in May 2011.

3.3. The PROMO project

The *Best Practice In Promoting Mental Health In Socially Marginalized People In Europe* (PROMO) project was conducted from 2007 to 2010 in 14 European countries: Austria, Belgium, Czech Republic, France, Italy, Germany, Hungary, Ireland, Netherlands, Poland, Portugal, Spain, Sweden, and United Kingdom. The institutions participating in the PROMO project were: the Unit of Social and Community Psychiatry of Barts and London School of Medicine (Queen Mary, University of London, coordinating centre); the Ludwig Boltzmann Institute for Social Psychiatry, Vienna; Universite Catholique de Louvain; Universzita Karlova v Praze; Etablissement Public de santé Hopital Mason Blanche, Paris; Hungarian National Institute for Health Development, Budapest; Charité Campus Mitte Universitätsmedizin Berlin; National University of Ireland Galway; Agency for Public Health, Lazio; Academic Medical Centre, Amsterdam; Instytut psychiatrii i Neurologii, Warsaw; Department of Clinical Epidemiology, Predictive Medicine and Public Health of the University of Porto Medical School; Instituto de Salud Publica, Madrid salud; and Karolinska Institute, Stockholm.
The study aimed to assess all generic and group specific services that potentially provided some type of mental healthcare for one or more of the socially marginalized, vulnerable or disadvantaged groups in the two most deprived areas of the capital city of each country.

3.3.1. Socially marginalised groups

Six marginalized, vulnerable or disadvantaged groups were established as the focus for the PROMO project: the homeless, street sex workers, asylum seekers and refugees, irregular migrants, travelling communities and the long-term unemployed.
The choice for these particular groups was based on the increased prevalence of mental disorders when compared to the general population, with the barriers they face in accessing health services and the difficulties to reach people with mental disorders in such groups and engage them in care (88).
The definition of homelessness comprised two categories of the existing ETHOS (European Typology on Homelessness and Housing Exclusion) typology (www.feantsa.org): rooflessness (sleeping rough or in emergency accommodation) and houselessness (with a place to sleep in hostels or other temporary accommodation). Asylum seekers and refugees were defined in relation to the 1951 UN Convention Relating to the Status of Refugees (161). An asylum seeker is a person who has been applying for refugee status according to the Convention, and a refugee is a person with granted refugee status. Irregular migrants are

those who are not in possession of a legal residency permit in the host country. The definition of street sex workers focused on people who sell sex outdoors (162). The definition of long-term unemployed was based on the EUROSTAT (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/une_esms.htm) definition of a person of the national working age who has been out of employment for 12 months or longer. Travelling communities were defined as any community that is committed to a nomadic or travelling lifestyle and/or regard travelling as an important part of their cultural identity. This definition included also those who are settled but face marginalization because of associations with travelling lifestyle tradition.

3.3.2. Identification of deprived areas

In each capital, two highly deprived areas were identified using available indices of deprivation. The population size of each area was intended to be between 80,000 and 150,000 inhabitants, with some flexibility to accommodate different local contexts and administrative boundaries. If the chosen areas were too small, contiguous areas were combined to achieve the target size. The selected areas in each city were, Vienna: District 16 and District 20; Brussels: Schaerbeek & St Josse and Molenbeek; Prague: Prague 3 & 7 and Prague 8; Paris: Secteur Flandre in the 19th arrondissement of Paris and La Courneuve & Aubervilliers in Seine-Saint-Denis; Berlin: Wedding and Kreuzberg; Budapest: District 8 and District 7 & 9; Rome: District 7 and District 15; Dublin: Dublin North Central and Dublin West; Amsterdam: Bos en Lommer & De Baarsjes & Geuzenveld-Slotermeer and Amsterdam Zuid Oost; Warsaw: Praga Polnoc and Wola; Lisbon: Marvila & Santa Maria dos Olivais and a group of smaller areas (Anjos, Castelo, Encarnação, Graça, Madalena, Mercês, Pena, Penha de França, Santa Catarina, Santa Engrácia, Santa Justa, Santiago, Santo Estêvão, Santos-o-Velho, São Cristóvão e São Lourenço, São José, São Miguel, São Nicolau, São Paulo, São Vicente de Fora, Sé, Socorro); Madrid: Villaverde and Centro; Stockholm: Rinkeby-Kysta & Spånga-Tensta & Skarpnäk and Sodermalm; London: Hackney and Tower Hamlets.

The focus on the most deprived areas in each capital cities was based on the assumption that marginalized groups are more frequently represented in such areas.

Ethical approval was not required for this study, as no patient data were collected.

3.3.3. Identification of services

In each area, all services providing any type of mental healthcare to people from any of the marginalized groups were identified, applying an inclusive understanding of mental healthcare to accommodate different health and social care systems. Services were first identified using available directories and lists, as well as information from local clinicians and local experts for one or more of the target groups. In interviews with services, the lists were then consistently complemented. Services located outside the area, but providing care for people from that area, were also included. In several cities, there were services providing care to people from both areas.

3.3.4. Assessment of services

A structured questionnaire was developed through a Delphi process involving experts from the 14 countries. The questionnaire was translated into the languages of all participating countries, and three pilot interviews were carried out in each country to assess the applicability and suitability. The final questionnaire obtained data about service organization including the type of provider, funding, accessibility, routine data collection, characteristics of staff and programs provided to people with mental health problems from marginalized groups.

The managers of the identified services were contacted and informed about the aims of the project. Interviews were carried out either face-to-face or over the phone. The assessments were conducted with the service managers themselves or with other members of staff with the relevant knowledge.

The services were classified as either generic or group specific. If 50% or more of the people using a service were from one of the marginalized groups, the service was classified as specific for that group. In cases in which this was difficult to assess, the self-definition of the service was used as the key criterion. Of 617 services assessed, 350 were generic services (comprising 221 mental healthcare, 84 social care and 45 general health) and 267 were group-specific services (51 mental healthcare, 187 social care and 29 general health).

Figure 7 shows the number of services assessed in each city.

Figure 7. Number of services (n) assessed in each city participating in the PROMO project.

4. Results

4.1. Instruments to assess intimate partner violence: a scoping review of the literature

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Abstract

A scoping review was conducted to map existing evidence on strategies to measure male and female intimate partner violence (IPV). PubMed®, ISI Web of Knowledge® and Scopus® databases were searched from inception to 2014. A total of 1098 studies were analyzed. To assess IPV, the most commonly followed strategy was the creation of study specific questions (30.3%). The Conflict Tactics Scales (CTS) was the most frequent choice amongst generic instruments, whereas for clinical samples, the preferred tool was the Abuse Assessment Screen (AAS). Prevalence estimates were generally higher when the original versions of the CTS were used.

This review provides a guiding frame of what exists in the IPV measurement literature, showing trends in the choice for a particular instrument according to administration methods and settings.

Key words: Intimate partner violence; Measurement; Instruments; Tools; Scoping review.

Introduction

Intimate partner violence (IPV) is a relevant social problem with deleterious consequences on the mental and physical health (1-4). A growing awareness to the magnitude and burden of IPV has been observed all around the world, promoting efforts to explore its epidemiology and propose effective public health measures (1, 5, 6), since statistics derived from clinical or criminal sources, are thought to represent the “tip of the iceberg” of a more widespread phenomenon (7).

The 2002 World report on violence and health, which summarizes data from periodic surveys performed in developed and in developing countries, have shown that between 10% and 50% of women experience physical violence at the hands of an intimate partner during their lifetime, and between 40% and 72% of all women who have been physically abused by a partner are physically injured at some point in life (8). In 2013, the WHO published a systematic review on the global prevalence of violence against women, showing that almost one third of all women who have been in a relationship have experienced physical and/or sexual violence by their intimate partner, with proportions varying from 23% in high income countries to 38% in the WHO South-East Asia region.(6).

This wide frequency range might uncover real differences in prevalence across sites but also just evidence differences in research options, including the performance of measurement tools.

Additionally, there are multiple definitions of IPV, and despite the efforts to test several screening approaches (4, 9-12), a lack of clarity remains on which target behaviors describe the phenomenon (13).

A literature review published in 2002 (14) summarized the characteristics of seven screening tools to identify IPV for use in clinical settings. However, it did not consider studies without a clear reference to an established instrument or studies using a set of specifically created questions intended to measure IPV, nor studies using those tools in settings other than the clinical context.

A more recent systematic review (15) summarized the characteristics of brief IPV assessment tools and focused on health care settings. It excluded studies that used tools to detect IPV perpetration, studies that aimed to estimate IPV prevalence and studies that used established tools for research (such as the Conflict Tactics Scale (CTS), the Index of Spousal Abuse (ISA), the Composite Abuse Scale (CAS), and the Abuse Behavior Inventory (ABI)).

Additionally, a compilation of IPV screening instruments for healthcare providers published by the Centers for Disease Control and Prevention (CDC), described instruments’ items and generic characteristics for application in health care settings (16). Again, this document only

included instruments for clinical purposes containing 20 items or less and also excluded those designed for research purposes.

None of these reviews covers all the available instruments for IPV assessment and there is no information about those studies that, although aiming to assess IPV, do not use an established tool.

Our aim is to map the existing scientific literature providing information on the type of instrumentation used for adult IPV assessment, both against women and men and under which circumstances. To encompass different study designs and allow broader inclusion criteria of studies we followed the proposed methodologies for conducting a scoping review (17, 18).

As opposed to systematic reviews, scoping studies use broad research questions to allow breath of coverage (19) and examine the extent, range and nature of research activity on a topic. Therefore, our scope of inquiry to guide the review process covered the following aspects of IPV assessment: a) what is the most commonly used instrument for assessing violence against adult women or against adult men; b) are different instruments preferred according to the research purpose and sample (to describe tendencies in the general population, for clinical assessment, to explore specific associations in samples of pregnant women, students or convenience); c) which method is chosen for the assessment of IPV using such instrument (telephone, face-to-face interviews, self-administered questionnaire, mail, computer-assisted); d) are there any differences in the prevalence estimates of IPV as obtained through the most commonly used instrument(s); e) is there a time-trend in the choice for any specific instrument of IPV assessment or a geographic trend for instrument(s) usage (continent-specific preference for a particular instrument)?

Methods

Identifying relevant studies

Eligible studies were identified through an electronic search in PubMed® database, using the expression *("Domestic Violence"[Mesh] OR "Sex offenses"[Mesh] OR "Spouse abuse"[Mesh] OR "intimate partner" OR "aggression"[Mesh]) AND (instrument OR tool OR scale OR questionnaire OR inventory) AND ("Population based" OR "community" OR "general population" OR "incidence" OR "prevalence").* The following limits were imposed: studies on Human, adult samples (19-64 years), written in English, French, Italian, Spanish or Portuguese. Scopus® and ISI Web of Knowledge® were also searched using the same expression, to include additional relevant journals eventually not covered by PubMed®, with special focus on Social Sciences and Psychology journals. Databases were searched from inception to December 2014.

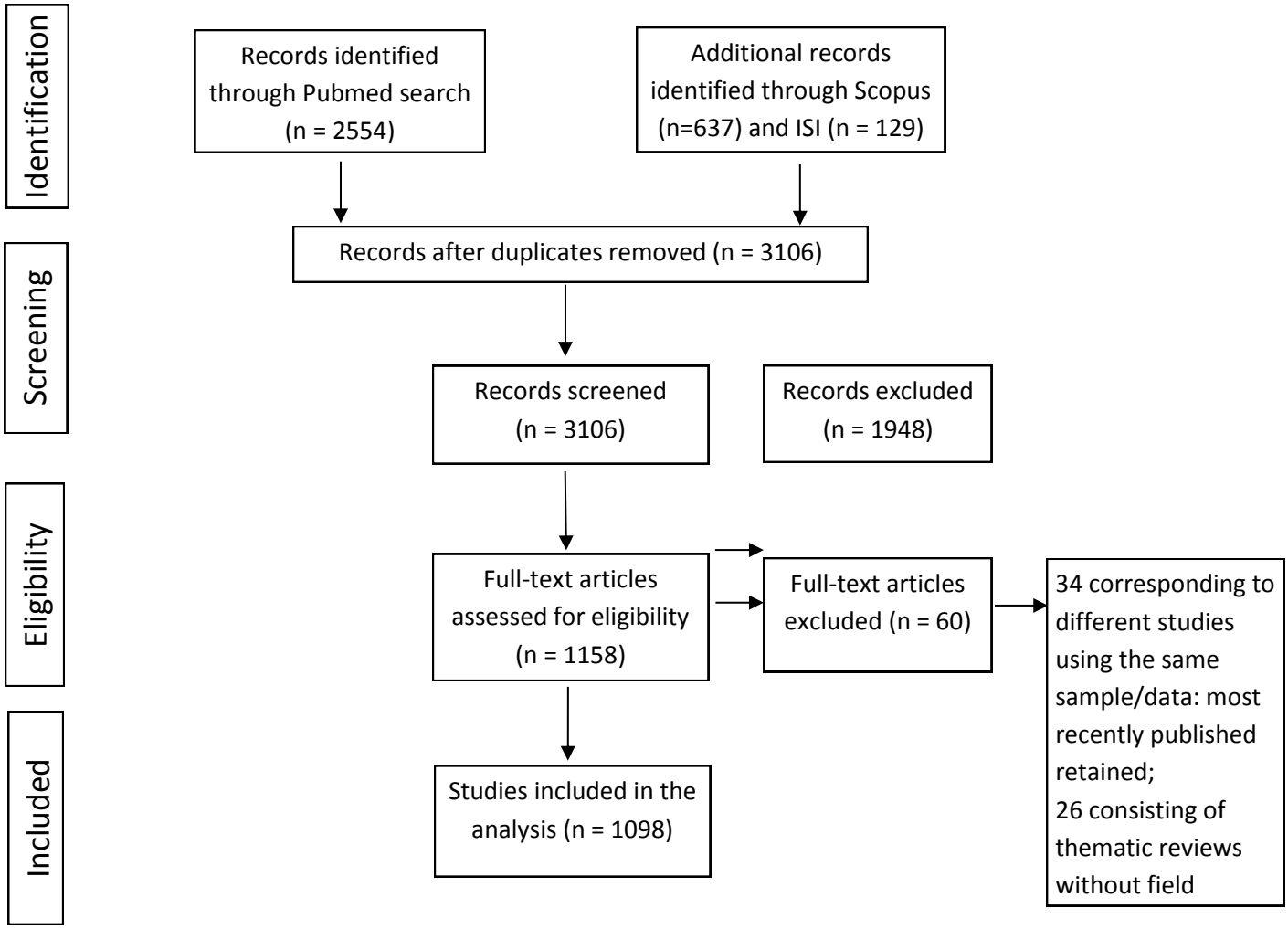
Study selection

After duplicates removal, 3106 articles were selected. Abstracts and titles were reviewed independently by two researchers who met frequently to discuss challenges and uncertainties related to study selection and discrepancies in the evaluation of the articles were solved by consensus, involving a third researcher. Studies were included if they reported on IPV in samples of adults in the scope of their intimate relationship.

We excluded: 1923 articles assessing parental violence, child abuse or overt aggression (studies that focused on aggressive acts not directed to an intimate partner, a child or parent, for example, aggressive behavior of psychiatric inpatients) and 25 studies using samples out of the selected age range.

After fully reviewing 1158 studies we excluded 34 studies describing repeated samples (in such cases, only the most recently published study was selected for analysis) and 26 literature reviews not presenting original material. Finally, 1098 articles were included for analysis (Fig.1).

Figure 1. Review Flow Chart



Charting the data

Data was extracted using a predefined form in Microsoft Excel format.

From each study we collected information on the sample considering the following aspects:

a) sampling frame and procedures used – population or community based samples (selected by random route, random-digit-dialing, electoral registers); clinical samples, obtained within an health facility (hospital inpatients, primary health care, waiting rooms of health unit, emergency department); pregnant women; students; other, when explicitly stated or gathered in specific conditions (including victims and perpetrators approached in shelters or intervention programs);
b) sample size;
c) country where the study was performed;

Regarding the instrument used, we gathered information on the following aspects:

d) designation: specific original scale name; whenever a modification to a specific scale was stated by the authors, the name of the original scale was the option with the exception of the Conflict Tactics Scales (or Revised), for which we decided to gather separate information for the original scale or the modified version; original questions created by authors, without a clear literature reference to a specific scale or instrument were extracted and coded as “original questions”, or when details concerning the method used to assess IPV were inexistent;
e) the questionnaire administration method used for assessment was extracted and classified as face to face interview, self-administered (pencil and paper), telephone survey, mail (or posted questionnaires), computer assisted interviews (whether performed through the internet or with a specifically created or existing software), or multi-method if a combination of methods was used; if not clearly stated or impossible to deduce from the description, the information on administration method was considered absent.

Other studies’ specificities extracted were:

f) violence direction - whether the study reported data on violence against woman (VAW), against men (VAM), or both. Samples exclusively of gay or lesbian couples (n= 13 studies), explicitly described with this wording in the article, were assumed as reporting on violence against men and women, respectively;
g) whenever a violence frequency measure was stated, we extracted the figure: we considered lifetime and past year prevalence estimates and estimates according to type of violence (any, physical, psychological or emotional, verbal and sexual). If only one estimate was provided as an overall prevalence and not referring to a specific type of violence, the figure was assumed as “any type” of violence. We collected victimization frequencies, whenever available. If studies only provided

frequencies based on perpetrators' report, they were considered for analysis from the victim perspective (for example, if the study reported violence perpetration in a sample of male who battered their female partners, we coded the estimate as VAW). When absolute frequencies were provided and the overall sample size was known, we calculated the corresponding prevalence. Prevalence estimates from studies presenting only aggregated gender information were not considered. We were able to identify 625 prevalence estimates for studies reporting exclusively on VAW, 20 on VAM and 100 from studies providing estimates for both directions of violence;

h) year of publication.

Studies providing reliability analysis, validity assessment or any type of psychometric analysis for any given instrument were marked and reviewed for the 3 most frequent established tools found. Original publications describing the scales were consulted and studies gathered in the scope of this review were explored, to extract information on content, construct and criterion validity, internal consistency, length of the scale and time of application, whenever available.

Collating, summarizing and reporting

To analyze the data gathered and to report results, we performed descriptive summaries for each feature valued for our purpose and specified by our guiding research question.

We computed the absolute and relative number of studies using each type of instrument. Median prevalence estimates and interquartile range or minimum and maximum values, were computed by type of violence (past year and lifetime physical violence, emotional or psychological, verbal, sexual or any), measurement instrument and gender. For the latter analysis we excluded studies using more than one instrument. We also computed median violence prevalence estimates as obtained from the most frequently used instruments according to six geographical regions (North America, Latin America, Europe, Africa, Australia and Asia) where the study was developed. Proportions of studies using the most commonly used instruments according to the type of sample assessed (general population, clinical, pregnant, student or other purposeful sample) and by world region, were compared using the Chi-square test. The median sample size of studies and the median prevalence violence estimates by instrument were compared using the Kruskal-Wallis Test.

The Statistical Package for Social Sciences version 21 was used for statistical analysis. A p-value <0.05 was considered significant.

Results

In almost one third of the analyzed papers, authors created study specific questions, being this, the most common strategy for assessing IPV.

The CTS (20) (original or modified version 1 and revised version) was the established survey tool most commonly used followed by the Abuse Assessment Screen (AAS) (21) (original or a modified version) and the World Health Organization (WHO) – Violence against Women Questionnaire (1) (original or modified versions). Used in 10 or more studies were the Index of Spouse Abuse, the Sexual Experience Survey, the Severity of Violence Against Women, the Partner Violence Screen, the Women's Experience with Battering, the Women Abuse Screening Tool, the Composite Abuse Scale, the Behavior Risk Factor Surveillance System module, the Norvold questionnaire, the Danger Assessment Scale, the HITS (Hurt Insult Threat Scream) and the Psychological Maltreatment of Women Inventory (Table 1). A list of the remaining instruments, classified as "others" and used once or twice, is provided in Appendix.

There was a significant difference in median sample size according to measurement instrument ($p<0.05$). The largest median sample sizes were found associated with the Behavior Risk Factor Surveillance System Violence module (BRFSS) (22), the Norvold questionnaire (23), the Women's Experience with Battering (WEB) (24), and the WHO tool.

Table 1. Number and type of instruments, direction of violence, sample sizes and publication year of studies assessing intimate partner violence

		Total**	VAW†	VAM‡	VAW&M	Sample Size	Publication Year
		n (%)	n (%)	n (%)	n (%)	Median (1Q-3Q)***	Median (1Q-3Q)
Study specific questions		**333 (30.3)**	263 (79.0)	5 (1.5)	65 (19.5)	464 (225-1437)	2006 (2002-2010)
Conflict Tactics Scales	**Modified or adapted**	**132 (12.0)**	93 (70.5)	4 (3.0)	35 (26.5)	422 (173-1861)	2006 (2003-2010)
	Original version 1 or 2	**138 (12.6)**	79 (57.2)	4 (2.9)	55 (39.9)	370 (178-979)	2010 (2006-2012)
Abuse Assessment Screen		**110 (10.0)**	104 (94.5)	-	6 (5.5)	550 (257-1216)	2007 (2004-2010)
World Health Organization – Violence Against Woman Survey		**92 (8.4)**	89 (96.7)	-	3 (3.3)	966 (502-1933)	2010 (2009-2012)
Index of Spouse Abuse		**31 (2.8)**	27 (87.1)	1 (3.2)	3 (9.7)	322 (157-779)	2006 (2000-2010)
Sexual Experience Survey		**22 (2.0)**	19 (86.4)	1 (4.5)	2 (9.1)	253 (159-501)	2008 (2003-2011)
Severity of Violence Against Woman		**22 (2.0)**	21 (95.5)	-	1 (4.5)	224 (150-518)	2008 (2001-2012)
Partner Violence Screen		**21 (1.9)**	16 (76.2)	1 (4.8)	4 (19.0)	283 (139-459)	2007 (2006-2011)
Women's Experience with Battering		**20 (1.8)**	19 (95.0)	-	1 (5.0)	1194 (469-3568)	2009 (2007-2010)
Woman Abuse Screening Tool		**18 (1.6)**	18 (100.0)	-	-	419 (75-1148)	2010 (2008-2012)
Composite Abuse Scale		**17 (1.5)**	16 (94.1)	-	1 (5.9)	365 (207-2094)	2011 (2009-2013)
Behavior Risk Factor Surveillance System module		**15 (1.4)**	11 (73.3)	1 (6.7)	3 (20.0)	2504 (486-3568)	2008 (2006-2010)
Norvold Questionnaire		**14 (1.3)**	11 (78.6)	3 (21.4)	-	2602 (1212-4349)	2010 (2004-2013)
Danger Assessment Scale		**11 (1.0)**	10 (90.9)	-	1 (9.1)	177 (135-1203)	2009 (2000-2013)
Hurt. Insult. Threat. Scream		**10 (0.9)**	4 (40.0)	3 (30.0)	3 (30.0)	383 (97-480)	2009 (2005-2010)
Psychological Maltreatment of Women Inventory		**10 (0.9)**	8 (80.0)	-	2 (20.0)	243 (192-405)	2012 (2006-2013)
Other*		**115 (10.5)**	71 (61.7)	4 (3.5)	39 (33.9)	343 (156-638)	2007 (2003-2010)
TOTAL			842 (76.7)	26 (2.4)	220 (20.0)	455 (203-1306)	2008 (2003-2011)

*Other instruments found and used in 1 or 2 of the analyzed studies. Full list presented in Appendix; **Percentages exceed 100% because more than one instrument could be used in a single study; ***p<0.05 for comparison of Median sample sizes according to instrument; †Studies assessing violence against women; ‡Studies assessing violence against men.

Most studies assessed violence against women. We identified 26 articles exclusively assessing violence against men.

The proportion of studies using specific questions to assess IPV did not differ significantly according to the type of sample addressed (p=0.265), (Table 2). A modified version of the CTS was the most commonly used instrument to assess population or community based samples (p=0.007). The AAS was preferred to evaluate clinical samples, particularly for screening IPV in pregnant women (p<0.001).

Table 2. Instruments for intimate partner violence assessment, according to the characteristics of the population assessed

		Sample					
		General population	**Clinical Samples**	**Pregnant women**	**Students**	**Other purposeful**	**p**
		n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	
Study specific questions		91 (34.2)	115 (30.2)	42 (24.0)	13 (20.6)	107 (32.1)	0.166
Conflict Tactics Scales	**Modified or adapted**	50 (18.8)	28 (7.3)	9 (5.1)	9 (14.3)	53 (15.9)	<0.001
	Original version 1 or 2	34 (12.8)	41 (10.8)	15 (8.6)	9 (14.3)	54 (16.2)	0.089
Abuse Assessment Screen		6 (2.3)	68 (17.8)	52 (29.7)	1 (1.6)	15 (4.5)	<0.001
World Health Organization – Violence Against Woman Survey		41 (15.4)	21 (5.5)	22 (12.6)	4 (6.3)	9 (2.7)	<0.001
Index of Spouse Abuse		3 (1.1)	13 (3.4)	7 (4.0)	1 (1.6)	16 (4.8)	
Sexual Experience Survey		3 (1.1)	3 (0.8)	1 (0.6)	5 (7.9)	12 (3.6)	
Severity of Violence Against Woman		-	8 (2.1)	9 (5.1)	-	11 (3.3)	
Partner Violence Screen		-	19 (5.0)	2 (1.1)	-	2 (0.6)	
Women's Experience with Battering		7 (2.6)	10 (2.6)	-	-	6 (1.8)	
Woman Abuse Screening Tool		1 (0.4)	12 (3.1)	2 (1.1)	-	3 (0.9)	
Composite Abuse Scale		-	12 (3.1)	3 (1.7)	-	2 (0.6)	
Behavior Risk Factor Surveillance System module		10 (3.8)	3 (0.8)	1 (0.6)	-	4 (1.2)	
Norvold Questionnaire		3 (1.1)	9 (2.4)	3 (1.7)	-	1 (0.3)	
Danger Assessment Scale		1 (0.4)	5 (1.3)	2 (1.1)	-	4 (1.2)	
Hurt. Insult. Threat. Scream		1 (0.4)	8 (2.1)	1 (0.6)	-	1 (0.3)	
Psychological Maltreatment of Women Inventory		2 (0.8)	2 (0.5)	3 (1.7)	-	5 (1.5)	
Other*		26 (9.8)	44 (11.5)	8 (4.6)	12 (19.0)	42 (12.6)	
TOTAL†		**266**	**381**	**175**	**63**	**333**	

*Other instruments found and used in 1 or 2 of the analyzed studies. Full list in Appendix; †Percentages do not add up to 100 because some studies used more than one instrument; p=p-value from chi-square test.

Following study specific questions, the BRFSS Violence module was the more frequently used tool administered via telephone (Table 3). The modified CTS was the most frequently self-administered tool following study specific questions and the WHO questionnaire was mostly administered though face to face interviewing.

The studies that provide frequency figures for IPV showed a large variation in point estimates for any type of past years' violence against men and women (Table 4). The highest median prevalence when considering all types of lifetime violence against women was found in the group of studies using the CTS ($p<0.001$). It was followed by studies using the WHO tool. Similar results were found for every other type of violence considered, for the lifetime and past year periods, although statistically significant differences were not found for verbal violence in both genders and for all types of violence considered in men with the exception of psychological or emotional violence (Table 4).

This review showed a predominance of studies from North America, which represents more than half of the publications analyzed (Table 5). The modified versions of the CTS were more frequently used in North America in both genders ($p<0.05$), whereas the WHO tool was more used in other world regions (namely in Asia, Africa and Latin America).

Purposeful original formulated questions represented a major methodological choice in all world regions.

Regardless of measurement instrument, we found the highest median prevalence of any type of past year violence for women in Africa and for men in North America.

Table 3. Type of instruments used to assess intimate partner violence, according to the method of administration

		Method of Administration					
		Self-administered	**Face to face**	**Telephone**	**CATI††**	**Mail**	**Multi-method**
		n (%)	**n (%)**	**n (%)**	**n (%)**	**n (%)**	**n (%)**
Study specific questions		81 (28.4)	143 (34.4)	13 (27.1)	11 (35.5)	20 (40.8)	3 (18.8)
Conflict Tactics Scales	**Modified or adapted**	33 (11.6)	63 (15.1)	8 (16.7)	3 (9.7)	2 (4.1)	2 (12.5)
	Original version 1 or 2	46 (16.1)	46 (11.1)	9 (18.8)	5 (16.1)	3 (6.1)	-
Abuse Assessment Screen		37 (13.0)	51 (12.3)	2 (4.2)	1 (3.2)	2 (4.1)	2 (12.5)
World Health Organization – Violence Against Woman Survey		11 (3.9)	71 (17.1)	-	-	1 (2.0)	1 (6.3)
Index of Spouse Abuse		10 (3.5)	12 (2.9)	-	1 (3.2)	-	-
Sexual Experience Survey		5 (1.8)	3 (0.7)	-	7 (22.6)	-	1 (6.3)
Severity of Violence Against Woman		4 (1.4)	15 (3.6)	-	1 (3.2)	1 (2.0)	-
Partner Violence Screen		8 (2.8)	9 (2.2)	-	-	-	2 (12.5)
Women's Experience with Battering		5 (1,8)	3 (0.7)	7 (14.6)	-	1 (2.0)	-
Woman Abuse Screening Tool		6 (2.1)	6 (1.4)	-	-	1 (2.0)	2 (12.5)
Composite Abuse Scale		8 (2.8)	5 (1.2)	-	-	1 (2.0)	1 (6.3)
Behavior Risk Factor Surveillance System module		3 (1.1)	-	10 (20.8)	-	-	-
Norvold Questionnaire		6 (2.1)	1 (0.2)	-	-	6 (12.2)	-
Danger Assessment Scale		6 (2.1)	3 (0.7)	-	-	-	-
Hurt. Insult. Threat. Scream		2 (0.7)	3 (0.7)	-	-	-	2 (12.5)
Psychological Maltreatment of Women Inventory		1 (0.4)	5 (1.2)	-	3 (9.7)	-	-
Other*		35 (12.3)	27 (6.5)	5 (10.4)	5 (16.1)	8 (16.3)	3 (18.8)
TOTAL†		**285**	**416**	**48**	**31**	**49**	**16**

*Other instruments found and used in 1 or 2 of the analyzed studies. Full list in Appendix; †Percentages do not add up to 100 because some studies used more than one instrument; ††CATI – Computer assisted telephone interview; p=p-value from chi-square test.

Table 4. Last year and lifetime prevalence of intimate partner violence against women and against men as obtained using the most frequent instruments (by type of violence)*

			Any Type of violence			Physical violence			Psychological/ Emotional violence			Verbal violence			Sexual violence		
			n	Median (1Q-3Q)	p	n	Median (1Q-3Q)	p	n	Median (1Q-3Q)	p	n	Median (1Q-3Q)	p	n	Median (1Q-3Q)	p
Last year Prevalence	Women	Study specific questions	60	12.1 (6.0-23.0)		40	10.0 (6.7-17.6)		19	26.8 (19.6-45.2)		10	21.4 (13.6-49.0)		17	8.6 (4.8-17.1)	
		CTS Modified or adapted	24	27.0 (10.4-40.5)		16	12.9 (6.8-26.2)		8	19.5 (10.5-42.0)		4	53.5 (14.4-92.0)		10	7.8 (3.9-19.0)	
		CTS Original version 1 or 2	17	27.0 (19.5-45.0)		29	14.0 (8.4-25.5)		16	54.5 (35.5-80.9)		4	82.8 (78.6-92.0)		13	8.0 (4.7-29.5)	
		Abuse Assessment Screen	34	9.1 (6.6-16.5)		19	6.2 (4.0-10.2)		7	13.6 (7.0-27.9)		-	-		14	4.4 (1.9-5.0)	
		World Health Organization	26	26.9 (18.2-42.1)		27	15.9 (12.0-23.4)		16	32.2 (22.3-42.1)		2	23.5 (16.0-31.0)		20	9.3 (4.8-15.9)	
		Other**	25	14.9 (9.0-32.3)	<0.001	16	11.5 (2.8-22.6)	<0.001	8	9.7 (6.5-34.3)	0.003	-	-	0.075	7	1.0 (0.7-23.0)	0.009
	All		**186**	**16.2 (7.6-31.4)**		**147**	**11.7 (6.7-19.2)**		**74**	**28.0 (16.4-45.6)**		**20**	**31.7 (15.0-79.3)**		**81**	**7.0 (3.3-16.0)**	
	Men	Study specific questions	5	7.0 (3.7-10.3)		-	-		-	-		-	-		-	-	
		CTS Modified or adapted	4	26.9 (9.1-43.2)		3	9.9 (2.8-11.9)†		3	49.4 (5.9-85.0)†		1	99.3		3	7.2 (6.0-10.1)†	
		CTS Original version 1 or 2	4	33.2 (19.5-52.8)		14	14.3 (7.5-31.3)		10	66.8 (49.7-90.2)		2	88.3 (87.0-89.5)†		6	3.2 (2.5-43.5)	
		Other**	4	14.1 (4.7-29.1)	0.100	7	3.0 (1.4-10.3)	0.073	4	4.0 (2.1-17.6)	0.025	-	-	0.259	3	0.3 (0.1-0.5)†	0.083
	All		**17**	**14.4 (6.9-32.5)**		**24**	**10.3 (5.4-19.7)**		**17**	**49.4 (21.9-81.0)**		**3**	**89.5 (87.0-99.3)†**		**12**	**3.2 (0.6-7.9)**	
Lifetime Prevalence	Women	Study specific questions	98	33.8 (18.9-47.2)		56	27.1 (18.2-40.8)		21	33.9 (23.9-55.5)		9	53.7 (24.6-86.5)		70	19.5 (10.0-32.0)	
		CTS Modified or adapted	36	29.5 (16.0-47.2)		22	25.0 (13.5-34.4)		12	22.3 (14.0-32.8)		3	80.0 (40.1-93.7)†		15	15.8 (10.6-37.3)	
		CTS Original version 1 or 2	16	56.5 (39.9-73.9)		22	21.0 (12.7-44.0)		16	57.5 (37.6-68.5)		2	34.3 (13.5-55.0)†		17	24.5 (10.1-33.7)	
		Abuse Assessment Screen	36	28.0 (17.0-42.8)		24	16.7 (13.0-25.2)		11	26.0 (6.8-28.8)		2	31.2 (21.3-41.0)†		14	8.8 (4.9-11.9)	
		World Health Organization	40	43.8 (29.3-58.5)		32	28.8 (13.2-32.2)		25	45.7 (23.6-55.5)		-	-		31	15.0 (6.6-28.8)	
		Other**	47	30.4 (22.0-48.4)	<0.001	33	26.1 (14.0-34.3)	<0.001	19	22.1 (16.8-48.8)	0.001	2	20.2 (5.0-35.4)†	0.400	38	19.1 (11.5-35.2)	0.024
	All		**273**	**34.3 (20.6-51.0)**		**189**	**24.6 (14.6-36.2)**		**104**	**34.1 (19.6-55.5)**		**18**	**40.1 (22.0-76.6)**		**185**	**16.8 (9.0-31.3)**	
	Men	Study specific questions	10	22.5 (8.8-28.9)		10	13.2 (8.5-23.2)		2	17.4 (14.8-20.0)†		-	-		18	11.2 (4.4-18.6)	
		CTS Modified or adapted	11	18.3 (14.6-39.2)		8	21.1 (7.7-31.2)		4	16.7 (11.0-30.2)		1	92.3		3	5.1 (0.2-20.0)†	
		CTS Original version 1 or 2	2	44.8 (42.0-47.5)†		7	11.0 (10.6-21.1)		6	55.5 (52.7-69.3)		-	-		6	5.8 (4.8-10.5)	
		Other**	12	29.1 (16.9-42.4)	0.202	12	22.6 (15.7-31.0)	0.084	4	14.8 (9.2-28.9)	0.020	1	23.5	0.317	9	9.0 (4.2-10.9)	0.159
	All		**35**	**23.0 (14.3-38.5)**		**37**	**17.0 (10.1-27.0)**		**16**	**20.0 (13.7-53.6)**		**2**	**57.9 (23.5-92.3)†**		**36**	**8.8 (4.2-12.6)**	

†Median (Minimum-Maximum); *In this table we excluded studies which used more than one instrument;**All other instruments;
p=p-value from Kruskal-Wallis test comparing median prevalence estimates according to instrument.

Table 5. Last year any type of violence prevalence and most common instruments used to assess of intimate partner violence against women and men, by world region

		North America		Latin America		Europe		Africa		Australia		Asia	
		n (%)	**Median (1Q-3Q)**	**n (%)**	**Median (1Q-3Q)**	**n (%)**	**Median (1Q-3Q)**	**n (%)**	**Median (1Q-3Q)**	**n (%)**	**Median (1Q-3Q)**	**n (%)**	**Median (1Q-3Q)**
Study specific questions	Women	147 (29.3)	8.7 (5.0-19.5)	24 (27.0)	17.6 (13.7-21.5)†	48 (31.4)	7.0 (4.6-25.0)	44 (41.9)	32.9 (15.6-40.2)	15 (34.9)	14.4 (5.8-22.9)†	50 (32.3)	19.5 (12.2-44.7)
	Men*	36 (23.4)	9.5 (6.4-12.6)†	6 (54.5)	-	16 (40.0)	4.0 (0.9-7.0)†	5 (71.4)	-	1 (14.3)	-	4 (30.8)	-
CTS Modified or adapted	Women*	82 (16.4)	41.3 (17.9-55.0)	10 (11.2)	14.6 (13.4-20.3)†	10 (6.5)	10.1 (2.0-37.9)†	8 (7.6)	35.1 (19.9-72.5)†	6 (14.0)	19.3 (11.2-28.0)†	11 (7.1)	20.1 (8.1-37.0)†
	Men*	33 (21.4)	43.1 (43.0-43.2)†	2 (18.2)	10.7††	1 (2.5)	-	-	-	2 (28.6)	8.5††	1 (7.7)	-
CTS Original version 1 or 2	Women*	84 (16.8)	29.8 (22.3-43.0)	9 (10.1)	33.4 (19.5-47.2)†	14 (9.2)	13.0††	3 (2.9)	17.2 (7.4-27.0)†	3 (7.0)	22.9††	16 (10.3)	29.2 (11.4-47.0)†
	Men	39 (25.3)	43.7 (29.3-58.0)†	-	-	8 (20.0)	16.2††	-	-	2 (28.6)	37.1††	5 (38.5)	-
Abuse Assessment Screen	Women*	50 (10.0)	8.9 (6.4-13.4)	10 (11.2)	19.3 (8.3-25.1)	25 (16.3)	10.3 (4.7-17.4)	5 (4.8)	21.0 (12.6-29.3)†	1 (2.3)	18.0††	19 (12.3)	11.3 (9.1-36.3)
	Men	5 (3.2)	16.5††	-	-	1 (2.5)	-	-	-	-	-	-	-
World Health Organization	Women*	-	-	24 (27.0)	26.7 (19.6-33.7)	10 (6.5)	17.9††	21 (20.0)	41.5 (24.4-65.7)	5 (11.6)	5.2 (5.0-18.2)†	31 (20.0)	34.6 (18.5-44.3)
	Men	-	-	1 (9.1)	-	2 (5.0)	-	-	-	-	-	-	-
Other**	Women*	155 (30.9)	16.9 (12.1-36.4)	13 (14.6)	-	42 (27.5)	14.3 (8.7-23.3)	6 (5.7)	36.7 (29.3-86.0)†	11 (25.6)	16.0 (7.9-17.8)	21 (13.5)	13.0 (7.2-40.0)†
	Men	46 (29.9)	4.8 (4.6-31.0)†	2 (18.2)	-	10 (25.0)	23.4††	-	-	1 (14.3)	1.9††	-	-
All	Women	**501**	**13.8 (7.0-30.9)**	**89**	**21.0 (18.0-34.6)**	**153**	**10.2 (5.3-16.4)**	**105**	**32.2 (15.6-42.6)**	**43**	**17.5 (5.8-22.9)**	**155**	**20.0 (11.3-40.5)**
	Men	**154**	**22.9 (6.0-43.1)**	**11**	**10.7††**	**40**	**11.6 (2.4-21.6)**	**7**	**-**	**7**	**8.5 (1.9-37.1)†**	**13**	**-**

*p<0.05 - chi square test comparing proportions of each instrument use by world region; **All other instruments; †Median (Minimum-Maximum); ††Single estimate;

Measurement properties of the 3 most common instruments:

The Conflict Tactics Scales (CTS)

The CTS measures both the extent to which partners in a dating, cohabiting, or marital relationship engage in psychological and physical attacks on each other and also their use of reasoning or negotiation to deal with conflicts. The most frequent application purpose of the CTS has been to obtain data on physical assaults on a partner. It requires only 6th-grade reading ability, is likely to be used with many cultural groups (25) and the time of application is 10 to 15 minutes. The revised version has 39 doubled items, i.e. items refer to whether a specific act has ever been experienced by the respondent or if the subject has perpetrated such act against his/her partner. It also allows measuring each act frequency during the previous year.

For the Revised Conflict Tactics Scales (CTS2), a factor analysis was performed by the scales' author in a student sample (n=317) confirming its theoretical structure (25). We found 5 more studies where a factor analysis was performed confirming the CTS2 structure: exclusively on the victimization form of the scale, in a Spanish sample of women recruited from several different settings (n=1266) (26), including health services, women's associations, work settings, and centers for victims (including a subgroup of battered women); performed in a sample of U.S. incarcerated women (27); using the Portuguese version of the CTS2 (28) in a sample of women admitted to hospitals for childbirth in Brazil; performed in a sample of U.S. incarcerated women with a history of substance abuse (29) and using the Italian version in a sample of 209 women (143 from the general population and 66 IPV victims) (30).

Cronbach alphas estimates for the different forms (victimization and perpetration) and scales of the CTS2 were identified in 34 methodologically diverse studies (Table 6).

Table 6. Cronbach alphas extracted from diverse studies for the Conflict Tactics Scales domains.

	Form	
Subscale	**Victimization**	**Perpetration**
Negotiation	0.86[1]; 0.82[8]; 0.80[30]; 0.83[34].	0.78[8]; 0.83[29];0.83[34].
Negotiation Emotional	0.79[1]; 0.71[34].	0.74[34].
Negotiation Cognitive	0.80[1]; 0.68[34].	
Psychological Aggression	0.84[1];0.78[3]; 0.79[8]; 0.79[12]; 0.89[18]; 0.81[21]; 0.84[33]; 0.78[34].	0.69[3]; 0.76[8]; 0.67[28]; 0.81[29]; 0.74[33]; 0.69[34]; 0.75[34].
Minor	0.79[1]; 0.79[34];	0.75[34].
Severe	0.77[1]; 0.75[12]; 0.73[34];	0.70[34].
Sexual Coercion	0.80[1]; 0.70[8]; 0.81[12]; 0.74[18]; 0.94[30]; 0.73[31]; 0.55[34].	0.88[8]; [0.17-0.42][15]; 0.75[28]; 0.80[29]; 0.44[34].
Minor	0.68[1]; 0.37[34].	0.18[34].
Severe	0.91[1]; 0.71[34].	0.77[34].
Physical Assault	0.93[1]; 0.90[3]; 0.86[8]; [0.82-0.88][10]; 0.91[12]; 0.87[14]; 0.93[17]; 0.91[18]; 0.91[19]; 0.92[21]; 0.89[22]; 0.93[23]; 0.92[25]; 0.91[27]; 0.90[31]; 0.88[34].	0.83[3]; 0.89[8]; 0.81[24]; 0.83[24]; 0.75[28]; 0.83[29]; 0.87[34].
Minor	0.89[1]; 0.78[33]; 0.84[34].	0.81[7]; 0.80[7]; 0.73[33]; 0.85[34].
Severe	0.88[1]; 0.90[12]; 0.83[33]; 0.76[34].	0.85[7]; 0.76[7]; 0.77[33]; 0.74[34].
Injury	0.81[1]; 0.81[8]; 0.92[12]; 0.87[30]; 0.73[34].	0.83[8]; 0.59[29]; 0.78[34]; 0.75[34].
Minor	0.35[1]; 0.75[34].	0.79[34].
Severe	0.72[1]; 0.96[12]; 0.73[34].	0.68[34].
Whole instrument or [range]	[0.78-0.88][4]; [0.88-0.96][5]; [0.74-0.85][6]; 0.89[9]; [0.85-0.87][11]; 0.83[26]; 0.74[26]; [0.68-0.84][34].	0.56[2]; 0.78[26]; 0.71[26]; 0.88[29]; [0.68-0.85][34].
Whole or [range]	0.91[13]; 0.75[15]; 0.94[16]; 0.93[18]; 0.93[20]; 0.96[20]; [0.88-0.96][32].	

References in this table: [1](26); [2](40); [3](41); [4](42); [5](43); [6](44); [7](45); [8](46); [9](47); [10](48);[11](31);[12](49); [13](50); [14](51); [15](52); [16](53); [17](54); [18](55); [19](56); [20](57); [21](58); [22](59); [23](60); [24](61); [25](62); [26](63); [27](64); [28](65); [29](66); [30](30); [31](67); [32](68); [33](69); [34](70).

Abuse Assessment Screen (AAS)

Designed as an instrument to assess domestic violence against women and to be used in healthcare settings, the AAS is a 5 items instrument measuring the frequency and perpetrator of physical, sexual, and emotional abuse. The original version includes a body map to document the area of injury. It was thought to be rapidly administered by the clinician (16).

Our search retrieved only one study providing an estimate for the scales' internal consistency (Cronbach alpha=0.88), performed in Hong Kong (31).

WHO instrument

The WHO questionnaire to assess violence was developed as part of the "WHO Multi-country Study on Women's Health and Domestic Violence against women", initially carried in ten countries. The study's approach to measuring violence was based on the tradition of the

CTS, in which respondents were asked questions about their experience of specific acts of physical and sexual violence by a current or former intimate male partner.
Psychometric analysis was performed to ascertain the appropriateness of the behavioral items included in the different measures of physical and sexual violence and controlling behaviors, and the Cronbach alphas were 0.81, 0.66, and 0.73, respectively (5). Factor analysis of the tool was performed in Brazil, confirming its structure (32, 33).

Discussion

With the present scoping review we were able to identify the most common methods to assess IPV, and to show that they differ according to research settings and purpose. This mapping of the evidence may be useful for the design of future studies focusing on specific settings and regions, once it provided a clearer picture of where, when, with what strategies, adaptations and overall results, is IPV in men and women being assessed. This might turn helpful to balance methodological choices and maximize comparability.

We found that almost one third of studies assessing IPV based their evaluations on questions purposefully created by the authors and not on standard scales, survey tools or instruments. We were not able to track any specific reference for these questions and cannot assert if they are completely original or adapted from an existing instrument. It is possible that many researchers aim to a more focused or in-depth look to the violence phenomenon, and that the existing instruments are not sensitive enough to address their concerns. We identified several convenience samples as being samples collected in shelters or victim-aid facilities, or even perpetrators treatment groups. In such studies there may be different interests apart from identifying violent acts, and the time spent administering a long structured questionnaire may not be feasible or respond to researchers needs. The same might apply to clinical samples, particularly in studies where violence is not the primary outcome but measured as a potential confounder. Nevertheless, we did not found a statistically significant difference in the proportion of studies that used specific questions according to the type of sample address.
The use of a standardized tool, allows a clearer operationalization of acts accounting for each type and nature of violence. Reporting, for instance, on physical violence, without operationalizing which acts, how frequent and followed by which instruction or cover story does not allow further replication, particularly in studies focusing such private and sensitive issue as IPV.
The CTS is the most frequently used standardized instrument. It has been described as the tool that first allowed researchers to “look behind closed doors” (34). We found that it is the

most popular instrument to assess IPV in North America, probably because of its author nationality and for being the first standardized tool of such kind (created in the 1970s (25)), for screening community samples, self-administered or by face to face interview. It was also the most common choice for assessing violence against men or involving both genders simultaneously, and it was the most psychometrically tested.

The second most common tool was the AAS, found to be almost exclusively used in clinical and pregnant samples, by face-to-face interviews or through self-administration and more frequent in Europe. This goes in line with its original designated aims - a brief questionnaire, easily and rapidly filled by pregnant women at health care departments (21, 35).

The WHO tool was the third most common, although no studies using this tool were found in North America. This might be expected since the WHO instrument was developed by a specific team to address violence against women in a selected group of countries for which a consortium was established (1, 5). Even though it has been adopted by several other teams, this might explain the lack of studies using this instrument in North American samples. It would be interesting to know how this tool performs in the Northern American culture and obtain comparable results, in order to have a real international frame of violence, since the WHO international collaboration aiming to assess VAW in the world and its health consequences (1), is often used to inform about the burden of IPV to women's health and its methodological protocol and ethical guidelines for assessing general population samples are exemplar for many researchers (36).

It is known that the method of administration and participants' preference for a method might influence disclosure of violence (11). Conversely, the influence of the setting of administration, in itself, seems to be less relevant, as a recent "experimental trial" showed for elder abuse, where the prevalence of violence was similar whether performing interviews in a hospital-based academic department or at the participant's home. Nevertheless, to assess their influence, figures extracted from different studies should only be compared when all these contextual features are similar.

According to our results, the majority of studies addressing violence against women provide high victimization rates. Our results also suggest that the frequencies of any type of violence against men may be higher than previously discussed which makes screening in the health settings and encounters an urgent need.

In this review, prevalence was consistently higher in studies using the CTS and the WHO tool and lower for the AAS, when compared with all other instruments. Again, special attention must be given to this finding because it might be reflecting a particular combination of population characteristics and instrument performance and not really discriminating the true background frequency of abuse.

The AAS provided the lowest median prevalence rates which might be a consequence of its items assessing mainly physical violence and referring to a particular period of life – pregnancy, when most violent behaviors tend to be omitted or change (37). The CTS (original and adapted or modified versions) was frequently used in non-probabilistic samples, which included identified victims from shelters, resulting in the higher median frequencies found for almost all types of violence and in both genders. High median frequencies for all types of violence were also observed with the use of the WHO tool, although it concerns almost exclusively violence against women (only three studies were found using the WHO tool to assess violence against men). These figures may result from the fact that the WHO tool was designed to be used with samples of the general population (1), and to allow for a more open expression, administered by extensively trained interviewers that ensure a climate of trust and empathy during the interview (38, 39).

Throughout the years, more defined, accurate and comprehensive measures have been used to detect and quantify violence, but still we found a broad prevalence range in our results. The results from this scoping review suggest that comparisons and reliability of prevalence estimates, putative determinants and consequences of IPV, are still limited because of the diversity of measurement instruments used and by a lack of clarity while describing adaptations performed to original versions of tools. The basic definition of the type, severity and nature of IPV under assessment in a given study is jeopardized if a clear-cut description of behavioral and act specific measurement is not provided.

Limitations

One of this reviews' limitation was the use of the same search expression in PubMed®, Scopus® and ISI Web of Knowledge® database. Although we have not used database-specific subject headings for the latter resources, we believe the search performed was sensitive enough to cover all relevant publications and those most likely to be analyzed by health-related research.

A limitation shared with other scoping reviews lies in the absence of a quality appraisal for studies included. However, we valued breath of published data over depth, and decided to analyze a considerable amount of articles to allow a more complete descriptive account of available research, instead of synthesizing the relative weight of evidence in favor of any particular methodological aspect.

In summary, IPV remains a prevalent public health problem requiring urgent attention from researchers and clinicians. Both clinical practice and research are hindered by lack of comprehensive evaluation of existing IPV screening tools. In light of our findings, there is a tendency to choose according to the method of administration and setting of application.

However, testing instruments against gold standard measures, applied systematically and controlling for potential confounders is lacking.

This is the first review of IPV instruments not confined to any particular type of research methodology. Consequently, it required the analysis of a considerable amount of studies, since the violence literature is vast and heterogeneous and encompasses several professional fields, namely sociology, psychology, public health, criminology, social work and nursing. The shared goal of violence elimination might only be possible through a better integration across research areas and clear description of methodological options taken. Even the alarming prevalence estimates are often expressing answers to differently worded questions, referring to different definitions, time-frames and sample types. By mapping the available tools, this review allows researchers from a broad range of fields to know what IPV tool was more often applied through which administration mode, where, and with what expected results.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Each author contributed to this work enough to take public responsibility for it.

DC was responsible for data gathering, analysis and interpretation and for drafting the first version of the paper; HB supervised the design of the study as well as data collection, contributed to the gathering, analysis and interpretation of results and critically revised the manuscript for intellectual content.

Both authors read and approved the final manuscript.

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Appendix

Other instruments found and used in 1 or 2 of the analyzed studies:

Castro (1); Family Stress Checklist (2); SAFE-T (3); Addiction Severity Index (4, 5); Abuse Behavior Inventory (6, 7); Abuse Disability Questionnaire (8); Abuse Inventory (9); Abuse Risk Inventory (10); Accountability Scale (11); Achenbach Child Behavior Checklist (12); Trauma Interview (4); Antenatal Psychosocial Questionnaire (13); Verhoek-Oftedahl (14); Brief Betrayal Trauma Inventory (15); Cervical Screening Questionnaire (16); Childhood Trauma Questionnaire (17); CIDI (Traumatic events) (18); Client Diagnostic Questionnaire (19); Community Experiences Questionnaire (20); Dissociative Disorders Interview Schedule (21); Domestic Violence Inventory (22); Dominance and Control Wheel (23); Drossman Abuse Questionnaire (24); Dyadic Adjustment Scale (25); Dyadic Consensus Scale (26); Family of Origin Violence Scale (27); George Washingtom Universal Prevention Screening Protocol (28); Husbands' Patriarc hal Beliefs Questionnaire (29); Index of Psychological Abuse (30, 31); Kansas Marital Scale (32); Ongoing Violence Assessment Tool (33, 34); Family violence scale (35, 36); Life Experiences survey (37); Marital Violence Inventory (38); Men's Nonconsensual Sexual Experiences Survey (39); Midwives' Knowledge and Attitudes to Domestic Violence Scale (40); Mississipi Scale (41); Multidimensional Assessment of Sex and Aggression (42); Ontario Domestic Assault Risk Assessment (43); Participant Profile Form (44); Partner Abuse Interview (45); Posttraumatic Diagnostic Scale (46); Physical Abuse Scale (47); Sexual Assault Subscale (48); Sexual Abuse History Inventory (49); Sexual Coercion in Intimate Relationships Scale (50); Sexual Harassment Inventory (51); Sexual Stress questionnaire (52); Stalking and Threatening Behaviors Inventory (53); Status of Women (54); The Partner Table (55); Traumatic Events survey (56, 57); Trauma Symptom Inventory (58); Traumatic Life Events Questionnaire (59, 60); Traumatic Stress Survey (61); Universal Violence Prevention Screening Protocol (62); Women's Health History Form (63); Domestic Abuse Checklist (64); Turkey Family Research Institution Questionnaires (65); Antenatal Psychosocial Health Assessment (66); Bradley questionnaire (67); Conflict in Adolescent Dating Relationships Inventory (68); Domestic Violence Exposure Questionnaire (69); Emotional Abuse Questionnaire (70); HARK (71); Intimate Violence Responsibility Scale (72); IPV-GBM (73); Measure of Psychologically Abusive Behaviors (74); Multidimensional Measure of Emotional Abuse (75); Nonviolent and Violent Offending Behavior Scale (76); Perpetrator Rapid Scale (77); Scale to measure male partner violence (78); STaT (slapped, threatened and throw) (79); Subtle and Overt Psychological Abuse of Women and Scale (80); Women Abuse Screen (81).

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4.2. Intimate partner violence in Europe: design and methods of a multinational study

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Methodological note

Intimate partner violence in Europe: design and methods of a multinational study

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ABSTRACT

Objective: To describe the design, methods, procedures and characteristics of the population involved in a study designed to compare Intimate Partner Violence (IPV) in eight European countries.
Methods: Women and men aged 18–65, living in Ghent-Belgium ($n = 245$), Stuttgart-Germany ($n = 546$), Athens-Greece ($n = 548$), Budapest-Hungary ($n = 604$), Porto-Portugal ($n = 635$), Granada-Spain ($n = 138$), Östersund-Sweden ($n = 592$), London-United Kingdom ($n = 571$), were sampled and administered a common questionnaire. Chi-square goodness of fit and five-age strata population fractions ratios for sex and education were computed to evaluate samples' representativeness.
Results: Differences in the age distributions were found among women from Sweden and Portugal and among men from Belgium, Hungary, Portugal and Sweden. Over-recruitment of more educated respondents was noted in all sites.
Conclusion: The use of a common research protocol with the same structured questionnaire is likely to provide accurate estimates of the general population IPV frequency, despite limitations in probabilistic sampling and restrictions in methods of administration.

La violencia de pareja en Europa: diseño y métodos de un estudio multinacional

Palabras clave:
Violencia infligida por la pareja
Métodos
Estudio multicéntrico
Hombres
Mujeres
Europa

RESUMEN

Objetivo: Describir el diseño, los métodos, los procedimientos y las características de la población participante en un estudio diseñado para comparar la violencia de la pareja íntima en ocho países.
Método: Formaron parte de la muestra mujeres y hombres (18–65 años de edad), residentes en Ghent-Bélgica ($n = 245$), Stuttgart-Alemania ($n = 546$), Atenas-Grecia ($n = 548$), Budapest-Hungría ($n = 604$), Porto-Portugal ($n = 635$), Granada-España ($n = 138$), Östersund-Suecia ($n = 592$) y Londres-Reino Unido (UK) ($n = 571$). Se les administró un cuestionario común. Se calcularon la prueba de ji al cuadrado de bondad de ajuste y razones de fracciones poblacionales de cinco estratos de edad, según sexo y nivel educativo, con la finalidad de evaluar su representatividad.
Resultados: Se encontraron diferencias en las distribuciones de edad en las mujeres de Suecia y Portugal, y en los hombres de Bélgica, Hungría, Portugal y Suecia. Ha habido un exceso de reclutamiento de encuestados con un nivel educativo más alto en todos los países.
Conclusiones: Un protocolo común de investigación con el mismo cuestionario estructurado puede proporcionar estimaciones precisas de la frecuencia de violencia de la pareja íntima en la población general, a pesar de las limitaciones existentes en la creación de muestras probabilísticas y en los métodos de administración.

Introduction

In Europe, there is no comprehensive investigation designed to estimate the size and impact of intimate partner violence (IPV) on the health status of adult men and women residing in different

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countries, applying common standardized measurement methods and assessing both victimisation and perpetration.

To address such gaps, we designed a cross-sectional community study aiming to estimate IPV prevalence, identify its determinants and health consequences, based on samples of adult men and women from eight European countries.

The current paper presents and discusses the design and methods of the DOVE project (Domestic Violence against Men/Women in Europe) and describes the study population characteristics in the participating centres.

Methods

Population

We targeted the general population aged 18–65 living in eight cities: Ghent–Belgium; Stuttgart–Germany; Athens–Greece; Budapest–Hungary; Porto–Portugal; Granada–Spain; Östersund–Sweden; London–United Kingdom (UK). Assuming an expected IPV prevalence of 15%[1] and 3.0% of relative precision, size of samples was determined as 544 (272 women) for each centre. Samples were proportionally stratified according to age and sex, based on national Statistics Institutes data for resident population in 2008. Non-institutionalized national citizens or documented migrants residing in the participating cities were eligible.

Sampling procedures

Registry-based sampling was used in Spain, Belgium, Germany and Sweden and random-route was used in Greece and Hungary. In Portugal, two strategies were used: registry-based sampling and random-digit-dialling. The UK also resorted to two sampling strategies: registry-based and a via-public approach.

Participants selected through registries were sent an invitation letter with a project summary. Data collection took approximately 9 months and was completed in May 2011.

Random sample lists were obtained through city's municipality registries in Belgium ($n = 2720$), Spain ($n = 2176$) and Germany ($n = 3077$), through electoral registry in Portugal ($n = 1990$) and UK ($n = 4720$) and through state person address registry in Sweden ($n = 1996$).

Additionally, in Porto we used random-digit dialling of Porto city landlines ($n = 10623$ calls) and in the UK participants were approached in public settings ($n = 1280$).

In Belgium, Portugal and Germany, after sending invitation letters, participants were called to schedule an interview. In Greece, random route sampling was based on stratification of four major regions of the Greater Municipality Area of Athens according to geographical proximity of municipalities and similar socioeconomic structure. In Hungary, streets were selected from localities in Budapest. An adapted Leslie Kish Key was used for participant selection.

Assessment tool

The assessment tool comprised a range of existing validated scales and questions designed specifically for this study. It included information on socio-demographics, intimate relationships, physical and mental health, use of medication, past-year health care use. The following scales were included: WHO-AUDIT – Alcohol Use Disorders Identification Test,[2] Short Form (SF-36) Health-Related Quality of Life Questionnaire,[3] Hospital Anxiety and Depression Scale (HADS),[4] Multidimensional Scale of Perceived Social Support (MSPSS),[5] and Post-Traumatic Stress Symptoms Scale.[6] IPV was assessed with the Revised-Conflict Tactics Scales (CTS2),[7] and violence-associated factors were examined with the Controlling Behaviours Scale–Revised[8] and seven items assessing exposure to child abuse.

The tool was piloted using convenience samples in each city ($n = 89$ total pilot sample) and the study protocol was approved by local Research Ethics Committees.

Method of administration

Questionnaires were administered by face-to-face interviewing for all sections, except for the IPV sections, which was self-administered for ethical reasons. As a last alternative option, questionnaires could be mailed in all countries if participants were otherwise unreachable. The only variation of administration occurred in Sweden, where questionnaires were posted to identified participants with a pre-paid envelope for return as per this ethics committee's request.

The WHO ethical and safety guidelines[9] for the conduct of this type of research were considered by all centres and a study manual was produced in accordance. Interviewer training included presentation of the projects' aims, detailed explanation of survey tool, role-playing involving scenarios related to introducing the interview, dealing with difficult participants and sensitive situations, research ethics and safety during field work including handling of reported/witnessed IPV incidents and a crisis-intervention protocol. The voluntary character of participation was emphasized and, although written informed consent was obtained by all face-to-face interviewed participants, no link between signed consents and questionnaires existed.

Necessary steps were taken by interviewers to ensure that the interview took place in a confidential and safe manner, meaning that only the trained interviewer and interviewee were present in the private setting during the completion of the questionnaire. In case a third person was present and refused to leave, the interviewer would have explained that, according with the study's objectives, he/she could not carry out the interview and would have tried to re-schedule it to another day and/or place. Questionnaires were administered at participants' home (Greece, Hungary), university premises (Belgium) or either places (Portugal, Germany). In the UK, university premises and pre-selected public locations (with private spaces) were used.

Statistical analysis

To assess national samples representativeness, chi-square goodness of fit tests were used to compare the proportions of participants with each city population. Also, Population Fractions (PFs) by age and sex were computed for each country, using the corresponding reference city population provided by the national statistics institutions for 2008. PF was defined as the number of persons responding in each age-sex group divided by the number of persons with the same characteristics according to the available data. Population fraction ratios (PFRs, ratio of men' to women' PF) were estimated for each country. PFRs greater than 1 indicate an "excess" of men in the sample, while an excess of women is indicated by PFRs lower than 1.

Participants' educational level was categorized to match International Standard Classification of Education (ISCED) into two categories: primary to secondary corresponding to ISCED levels 0–4 (pre-primary, primary, basic, secondary and post-secondary non-tertiary education), and university corresponding to ISCED levels 5 to 6 (tertiary). These were compared with the corresponding reference country population as available in Eurostat[10] for 2009. PFs by age and education were computed for each country, so as PFRs for education. An "excess" of participants with education

level university is indicated by PFRs lower than 1, compared to the country's distribution in that age strata.

A within-country comparison of the resulting samples according to age, sex and education was conducted for Portugal and UK. Chi square tests and Student's *t*-tests were used when appropriate. The Statistical Package for Social Sciences version 18 was used.

Results and discussion

Across study sites, more women than men participated in the study (Table 1, and see Table I in online Appendix) and a slightly higher proportion of older women participated compared to the city populations. Significant differences in the age distributions were found among women from Sweden and Portugal and among men from Belgium, Hungary, Portugal and Sweden (Table 1).

This may be expected, since Europe is currently facing a general demographic decline with the ageing of part of its population. We also interviewed proportionally more university-educated people than expected (Table 2, and see Table II in online Appendix). However, the comparison we have presented is based on available data from Eurostat for 2009, referring to whole country populations and not specifically the urban centres sampled. This could explain why the education level of participants is higher than the national educational level for the age and gender groups analysed.

In Spain and Belgium, logistical and ethical constraints made it impossible to reach the target sample size in due time compromising the statistical power for drawing inferences when considering these samples. In particular, the Spanish team experienced significant delays obtaining census registries from the Spanish National Statistics Institute and recruiting participants due to public reluctance to discuss about domestic violence after important media exposure. In Belgium, the fieldwork was constrained by the fact that the ethics committee allowed only for interviews to be conducted in the university facilities and did not approve telephone or postal interviews, which resulted in poor recruitment rates. Nevertheless, the probabilistic sampling approach, based on total number of residents from each urban centre, was expected to allow reasonable approximations to the cities' demographic characteristics.

We were not able to evaluate correct cooperation and response rates in our samples, since information on refusals was not collected and, in some cases, it was even impossible to obtain due to the sampling procedures. However, a comparison of characteristics of participants sampled from different sources, within the same country, was conducted for the Portuguese and UK samples which adopted this approach (the remaining countries used only one sampling frame to identify participants: Greece and Hungary by random route, Sweden, Spain, Germany and Belgium through municipal or state person registries). Results from this comparison confirmed that, despite minor differences (more men and younger participants recruited via public vs. electoral registry), no statistically significant difference in the prevalence of any type of violence was found (results not shown). Therefore, it can reasonably be assumed that participants' characteristics were similar, independently of the sampling method used.

Overall it is noted that the cross-country design of the study as well as its sensitive topic raised a number of challenges of the project teams during the recruitment of participants and conduct of the fieldwork, which was completed with some minor time difference between sites. Nonetheless, the use of a common research protocol and survey tool has assisted in providing comparable prevalence estimates of IPV in men and women across the project centres.

Table 1
Samples obtained and city population in each centre for age groups 18–65 years, by sex.

	Belgium		Germany		Greece		Hungary		Portugal		Spain		Sweden		UK	
	Sample	Ghent	Sample	Stuttgart	Sample	Athens	Sample	Budapest	Sample	Porto	Sample	Granada	Sample	Ostersund	Sample	London
Women (years)																
18–24	14.7	13.8	10.1	14.1	15.9	16.3	13.8	11.1	8.1	10.5	15.4	14.3	11.1	10.0	18.1	13.0
25–34	17.1	26.5	22.6	25.7	23.9	24.7	21.9	24.7	10.3	21.9	24.4	24.7	18.1	12.6	23.8	25.4
35–44	24.0	21.8	25.5	22.8	22.8	21.6	21.6	19.0	15.2	22.2	23.1	24.7	21.1	12.9	25.2	26.2
45–54	21.7	20.8	23.0	20.6	21.0	20.7	19.4	22.6	22.1	22.7	19.2	20.6	22.2	13.1	20.5	19.6
55–64	22.5	17.2	18.9	16.9	16.3	16.7	23.3	22.6	44.4	22.8	17.9	15.7	27.6	51.5	12.4	15.8
Total, *n* (%)	129 (5.8)		318 (14.2)		276 (12.4)		356 (15.9)		408 (18.3)		78 (3.5)		370 (16.6)		298 (13.3)	
p	0.143		0.115		0.988		0.171		<0.001		0.976		<0.001		0.069	
Men (years)																
18–24	12.1	12.9	10.5	13.1	17.3	17.1	15.7	12.3	8.8	12.2	13.3	14.7	6.8	9.5	13.2	12.7
25–34	13.8	27.8	23.2	25.5	28.7	28.7	22.2	26.8	8.4	24.2	20.0	25.7	15.3	12.9	27.8	25.8
35–44	12.1	22.9	21.9	24.7	22.1	21.8	27.0	19.8	19.4	22.2	30.0	25.0	21.6	13.4	26.4	27.4
45–54	31.0	20.4	23.2	21.1	18.4	18.7	14.1	21.5	30.4	21.4	20.0	20.2	25.7	12.2	18.3	19.4
55–64	31.0	16.1	21.1	15.6	13.6	13.7	21.0	19.7	33.0	19.9	16.7	14.5	30.6	52.0	14.3	14.6
Total, *n* (%)	116 (7.0)		228 (13.9)		272 (16.5)		248 (15.1)		227 (13.8)		60 (3.6)		222 (13.5)		273 (16.6)	
p	<0.001		0.128		1.000		0.002		<0.001		0.803		<0.001		0.941	

Figures are %. In London, city reference population corresponds to four South West London boroughs.

Table 2
Education level in the sample and in participating countries (Eurostat 2009).

	Primary to secondary		University	
	Sample	Population	Sample	Population
Belgium	30.6	68.9	69.1	31.1
Germany	45.3	76.6	54.7	23.4
Greece	68.5	79.0	31.5	21.0
Hungary	74.7	82.2	25.3	17.8
Portugal	58.8	86.2	41.2	13.8
Spain	36.5	72.1	63.5	27.9
Sweden	49.3	70.9	50.7	29.1
United Kingdom	43.2	68.8	56.8	31.2

All comparisons $p < 0.001$ (chi square goodness of fit test); Primary to secondary correspond to ISCED groups 1 through 4; University correspond to ISCED groups 5 and 6.

Authors' contributions

D. Costa, J. Soares, J. Lindert, E. Hatzidimitriadou, O. Sundin, O. Toth, E. Ioannidi-Kapolou and H. Barros conceived the study, participated in its design and coordination. D. Costa performed the statistical analysis and drafted the manuscript. All authors critical reviewed the manuscript providing important intellectual contributions. All authors read and approved the final manuscript.

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Conflict of interest

None.

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Appendix. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.gaceta.2013.03.001.

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Table I. Population Fractions (PF) and Population Fraction Ratios (PFR) for sex by age group according to recruitment strategy.

Recruitment Strategy	Age group / Sex	18-24 Male PF (‰)	18-24 Female PF (‰)	25-34 Male PF (‰)	25-34 Female PF (‰)	35-44 Male PF (‰)	35-44 Female PF (‰)	45-54 Male PF (‰)	45-54 Female PF (‰)	55-65 Male PF (‰)	55-65 Female PF (‰)
Municipal/ National Registries	Belgium	1.43	1.87	0.76	1.13	0.81	1.94	2.33	1.83	2.95	2.30
	PFR	0.8		0.7		0.4		1.3		1.3	
	Germany	0.92	1.18	1.04	1.45	1.02	1.84	1.26	1.84	1.87	1.84
	PFR	0.8		0.7		0.6		0.7		1.0	
	Spain	0.18	0.29	0.16	0.27	0.24	0.25	0.20	0.25	0.23	0.31
	PFR	0.6		0.6		1.0		0.8		0.8	
	Sweden	5.31	13.85	8.88	17.98	12.02	20.43	15.79	21.19	4.40	6.68
	PFR	0.4		0.5		0.6		0.7		0.7	
Random Route	Greece	1.04	0.97	1.03	0.96	1.05	1.05	1.02	1.01	1.03	0.97
	PFR	1.1		1.1		1.0		1.0		1.1	
	Hungary	0.57	0.69	0.38	0.54	0.66	0.68	0.31	0.53	0.51	0.66
	PFR	0.8		0.7		1.0		0.6		0.8	
Electoral Registries + other (RDD and via public)	Portugal	2.44	4.31	1.29	2.55	3.09	3.76	4.89	5.36	6.05	11.05
	PFR	0.6		0.5		0.8		0.9		0.5	
	UK	1.18	1.73	1.22	1.17	1.09	1.20	1.07	1.30	1.11	0.97
	PFR	0.7		1.0		0.9		0.8		1.1	

Table II. Population Fractions (PF) and Population Fraction Ratios (PFR) for Education level by age group according to recruitment strategy.

Age group		18-24		25-34		35-44		45-54		55-65	
Education level		Primary to secondary	University	Primary to secondary	University	Primary to secondary	University	Primary to secondary	University	Primary to secondary	University
Recruitment Strategy		PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)	PF (‰)
Municipal/ National Registries	Belgium	0.01	0.14	0.01	0.05	0.01	0.06	0.02	0.09	0.03	0.10
	PFR	0.09		0.23		0.15		0.20		0.22	
	Germany	0.01	0.05	0.00	0.03	0.01	0.02	0.01	0.02	0.01	0.02
	PFR	0.12		0.14		0.26		0.37		0.33	
	Spain	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
	PFR	0.08		0.15		0.29		0.20		0.33	
	Sweden	0.04	0.41	0.07	0.11	0.04	0.19	0.09	0.16	0.10	0.23
	PFR	0.10		0.65		0.22		0.56		0.45	
Random Route	Greece	0.10	0.29	0.08	0.12	0.06	0.11	0.06	0.10	0.05	0.12
	PFR	0.36		0.63		0.57		0.62		0.44	
	Hungary	0.09	0.17	0.08	0.09	0.10	0.15	0.07	0.12	0.09	0.20
	PFR	0.53		0.92		0.66		0.53		0.46	
Electoral Registry + other	Portugal	0.04	0.27	0.02	0.11	0.03	0.24	0.07	0.38	0.15	0.89
	PFR	0.17		0.15		0.14		0.19		0.17	
	UK	0.01	0.06	0.01	0.03	0.01	0.03	0.01	0.02	0.01	0.02
	PFR	0.10		0.31		0.38		0.64		0.54	

Primary to secondary correspond to ISCED groups 1 through 4; University correspond to ISCED groups 5 and 6.

Table III. Within country comparison of participants recruited though different sampling strategies in Porto, Portugal and London, United Kingdom.

		Porto - Portugal		London - United Kingdom		
		Electoral registers	**RDD**	**Electoral registers**	**Via public**	
Female	**n (%)**	65 (56.0)	343 (66.1)	70 (63.1)	228 (49.6)	*
Age	**mean (SD)**	48.1 (10.9)	47.9 (13.4)	45.1 (12.2)	36.9 (12.2)	*
Education	**ISCED 0-4 n (%)**	64 (55.2)	308 (59.6)	43 (41.0)	194 (43.7)	
	ISCED 5-6 n (%)	52 (44.8)	209 (40.4)	62 (59.0)	250 (56.3)	
Any IPV involvement in past-year n (%)	**Psychological**	61 (53.5)	252 (51.9)	72 (69.2)	272 (65.4)	
	Sexual coercion	22 (19,3)	112 (23.0)	19 (18.3)	112 (26.9)	
	Physical	12 (10.5)	55 (11.3)	24 (23.1)	90 (21.6)	
	Injury	4 (3.5)	19 (3.9)	8 (7.7)	40 (9.6)	
Mental health	**Anxiety (HADS>7) - n (%)**	37 (31.9)	163 (31.6)	25 (22.5)	123 (27.2)	
	Depression (HADS>7) - n (%)	15 (12.9)	74 (14.3)	17 (15.3)	74 (16.3)	
Past-year healthcare	**Emergency department - n (%)**	42 (36.8)	145 (29.0)	19 (16.9)	58 (14.1)	
	Family doctor - n (%)	95 (81.9)	376 (73.9)	73 (68.2)	258 (58.1)	

*p-value<0.05; RDD: Random digit dialing; HADS: Hospital anxiety and depression scale; IPV – Intimate partner violence; ISCED: International standard classification of education;

4.3. Intimate partner violence: a study in men and women from six European countries

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Abstract

Objectives: We aimed to assess intimate partner violence (IPV) among men and women from six cities in six European countries.

Methods: Four IPV types were measured in a population-based multicentre study of adults (18-64 years; n=3496). Sex- and city-differences in past-year prevalence were examined considering victims, perpetrators or both and considering violent acts' severity and repetition.

Results: Male victimization of psychological aggression ranged from 48.8% (Porto) to 71.8% (Athens) and female victimization from 46.4% (Budapest) to 70.5% (Athens). Male and female victimization of sexual coercion ranged from 5.4% and 8.9% respectively in Budapest to 27.1% and 25.3% in Stuttgart. Male and female victims of physical assault ranged from 9.7% and 8.5% respectively in Porto, to 31.2% and 23.1% in Athens. Male victims of injury were 2.7% in Östersund and 6.3% in London and female victims were 1.4% in Östersund and 8.5% in Stuttgart. IPV differed significantly across cities ($p<0.05$). Men and women predominantly experienced IPV as both victims and perpetrators with few sex-differences within cities.

Conclusion: Results support the need to consider men and women as both potential victims and perpetrators when approaching IPV.

Key words: Intimate Partner Violence, Europe, Population-based

Introduction

Intimate partner violence (IPV) is a violation of human rights and one of the most frequently experienced forms of violence (1). In 2002, the World Health Organization (WHO) – World Report on Violence and Health (2) described the prevalence of past year IPV against women as ranging from less than 3% in Australia, Canada and the United States (US) to more than 30% in Israel, Peru, West Bank and Gaza Strip. A 2013 WHO global systematic review showed that 35% of women ever experienced either physical and/or sexual IPV or non-partner sexual violence (3). However, some countries in Europe such as Hungary, Portugal and Greece still lack such estimates.

Studies designed to measure the frequency and identify the determinants of IPV focus mostly on women as victims (1, 4-6). However, a review of 91 studies showed that one in five men was a victim of IPV (7) and poor health outcomes have been associated with male victimization (8).

IPV against women tends to be a repetitive act though with varied frequency. Over 15% of ever-injured women in Brazil, Peru or Thailand but only 1% of Ethiopian women reported that it happened more than five times in their life (9). Descriptions, interpretations and international comparisons of IPV may lose insight without information on repetition of acts. The chronicity dimension might additionally elucidate any sex-difference of IPV (10) since one of the criticisms of prevalence surveys is that simple “counts” of acts might translate into false sex-symmetric rates if not accounting for systematic patterns or repetition of acts (11).

Little is known on reciprocal violence in the general population (12), defined as simultaneous involvement in perpetration and victimization. A sample of 848 blue-collar American couples showed a 14.2% prevalence of reciprocal, 6.1% male-to-female only and 9.3% female-to-male only violence (13). In young American couples reciprocal violence was as common as non-reciprocal, but more likely to result in injury (14). In an analysis of 1046 couples representing married and cohabiting couples from 48 states in the USA, approximately 8% reported reciprocal violence, close to 4% reported that there was perpetration of violence by the male partner only and approximately 2% reported the perpetration of violence by the female partner only (15). No information on the magnitude of reciprocal violence is available for the adult European general population and cross-cultural comparisons are limited to physical and sexual IPV against women. Psychological abuse has been less studied and may further help explaining other components of male and female IPV experiences.

The observed geographical differences in IPV against women can reflect real variability or just different study designs, making figures not directly comparable. This paper presents results of the DOVE project – Domestic Violence against men/women in Europe, designed to compare IPV victimization and perpetration in men and women from the general population using a multi-country sample and the same IPV definitions.

Methods

DOVE was a cross-sectional multicenter study involving non-institutionalized adults (18-64 years) from eight European cities: Ghent–Belgium, Stuttgart–Germany, Athens–Greece, Budapest–Hungary, Porto-Portugal, Granada–Spain, Östersund–Sweden and London–United Kingdom (UK). Sites were selected based on previous collaboration (16, 17), and to represent geographical and cultural diversity across Europe.

Study design and participants

Detailed description of DOVE's design and participants characteristics' is available elsewhere (18). The sample size was established on the basis of required levels of statistical power to estimate and compare the prevalence of IPV across sites. Assuming an IPV prevalence of 15% (19) and 3.0% of relative precision, samples size was calculated as 544 (272 women) per center representing a proportionally stratified age- and sex-distribution of the resident population (2008 national data). Four sampling strategies were used: registry-based in Stuttgart and Östersund, registry-based and random-digit-dialing in Porto, registry-based and via-public approach in London and random-route in Athens and Budapest. Registries were municipal in Stuttgart, electoral in Porto and London, and the state person-address in Östersund. Invitation letters with a concise project description were sent to participants selected based on registries. The study was presented by interviewers as part of the invitation procedure to participants contacted through telephone or at their houses.

For the present study 3496 (women=2026) participants from six centers were considered (Supplementary Table 1). Data from Ghent (n=245) and Granada (n=138) were excluded since the target sample size was not achieved.

Socio-demographic characteristics included sex, age, education (categorized in secondary level or less and university degree), marital status (single, cohabiting, married or separated/divorced) and migrant background (participants indicating another place of birth than the country they lived in or another nationality). These were collected by face-to-face interview in Athens, Budapest, Porto and London. In Östersund, as per ethics demand, questionnaires were mailed and returned using a pre-paid envelope. In Stuttgart, a number of face-to-face interviews were conducted but most questionnaires were mailed (74.5%). Also in Porto (14.0%) and London (3.5%), a small proportion of participants opted for participation by post. In all sites, the IPV section was self-administered. Data collection took 9 months and was completed in May 2011.

Outcome measures

The same standardized and validated questionnaire was self-administered by participants in all centers to assess IPV, ensuring that the definitions of IPV types assessed were the same.

Past year prevalence of IPV against men and against women was assessed using validated versions of the Revised Conflict Tactics Scales (CTS2) (20), originally developed in English, available in Portuguese, German and Swedish (21, 22). Translations to Greek and Hungarian followed a standard protocol: forward translation, expert panel revision, back-translation, new expert panel revision and piloting. The CTS2's act-specific type of questioning was used in cross-cultural research on IPV against women, namely in the WHO multi-country study (1) or the Demographic Health Surveys (DHS) (23) and in the study of elder abuse (24). The CTS2 allows to measure psychological aggression (8 items), physical assault (12 items), sexual coercion (7 items) and injury (6 items). For each act, the participant answers two questions: the frequency of the act by a current or former partner (victimization) and the frequency by the participant (perpetration) i.e., each participant responded from both perspectives: as a victim and as a perpetrator.

Participants were asked "How often did this happen in the past year?" and eight frequency options given: once in the past year, twice, 3-5 times, 6-10 times, 11-20 times, more than 20 times, not in the past year but ever happened, and never happened.

The questions covered acts of "minor" or "severe" violence according to risk of injury that would require medical attention (20). Even though "moderate" and "severe" may be considered more appropriate terms, we followed the original scales' author terminology.

The frequency of abuse was categorized as once, 2-to-5 and more-than-5 times, and was considered a measure of chronicity instead of the mean number of acts to overcome the skewed sample distribution (25). Participants were characterized as victims or perpetrators of "minor" or "severe" violence according the severity of the reported act.

Ethical considerations

The WHO ethical and safety guidelines (26) were taken account in the fieldwork design and the study protocol was approved by local Research Ethic Committees, ensuring that the principles of anonymity and informed consent were upheld.

Interviewers received instructions for conducting interviews in the presence of the participant alone. If privacy was not ensured, the interviewer would kindly apologize and stop the questioning. When there was face-to-face contact, participants were given an envelope where to put the self-administered violence-module of the questionnaire, that was sealed and returned to the interviewer. The training of interviewers followed a standardized protocol, previously created by the research team. It included presentation of the project aims, role-playing involving scenarios related to introducing the interview, dealing with difficult participants and sensitive situations during the interview, research ethics and safety of participants and researchers during field work including handling of reported/witnessed IPV incidents, and a crisis-intervention protocol. The voluntary character of participation was

emphasized and although written informed consent was asked to all face-to-face interviewed participants, no link between signed consents and questionnaires existed.

Data analysis

Sex-specific, age-standardized (European standard population) past year period-prevalence (and 95% confidence intervals) of victimization and perpetration was calculated. For each violence type and sex, the frequency of uni-directional and bidirectional/reciprocal (being victims and perpetrators of the same type of violence (14)) was computed. Chi-square and Fisher exact tests were used to compare prevalence by sex, city and violence type. SPSS v20 was used for analysis.

Results

Victimization

Psychological aggression

The prevalence of women victims of psychological aggression ranged from 46.4% (41.3-51.6%) in Budapest to 70.5% (65.1-75.8%) in Athens (Figure 1). Porto (48.8%, 42.3-55.3%) presented the lowest and Athens (71.8%, 66.5-77.2%) the highest prevalence of male victims. Severe acts were reported by 37.4% (31.6-43.2%) of men and 30.0% (24.6-35.4%) of women in Athens and by 9.7% (5.8-13.6%) and 8.0% (5.2-10.8%), respectively in Östersund (Figure 3).

The prevalence of psychological aggression of both sexes was similar in every city except Budapest, where men reported more often being victims (58.8% vs. 46.4%, p=0.04), either of minor (31.6% vs. 26.3%) or severe acts (27.0% vs. 19.9%, p=0.01).

Sexual coercion

Sexual coercion was reported by 9.2% (6.2-12.1%) of women in Östersund and 8.9% (6.0-11.9%) in Budapest, being over 20% in the remaining cities (Figure 1). In men, estimates ranged from 5.4% (2.6-8.2%) in Budapest to 27.1% (21.3-32.9%) in Stuttgart. In women, the frequency of severe acts was lower in Östersund (1.7%, 0.4-3.0%) and higher in London (9.2%, 5.9-12.5%), with no male cases in Östersund and 5.5% (2.8-8.2%) in Athens men (Figure 3).

Physical assault

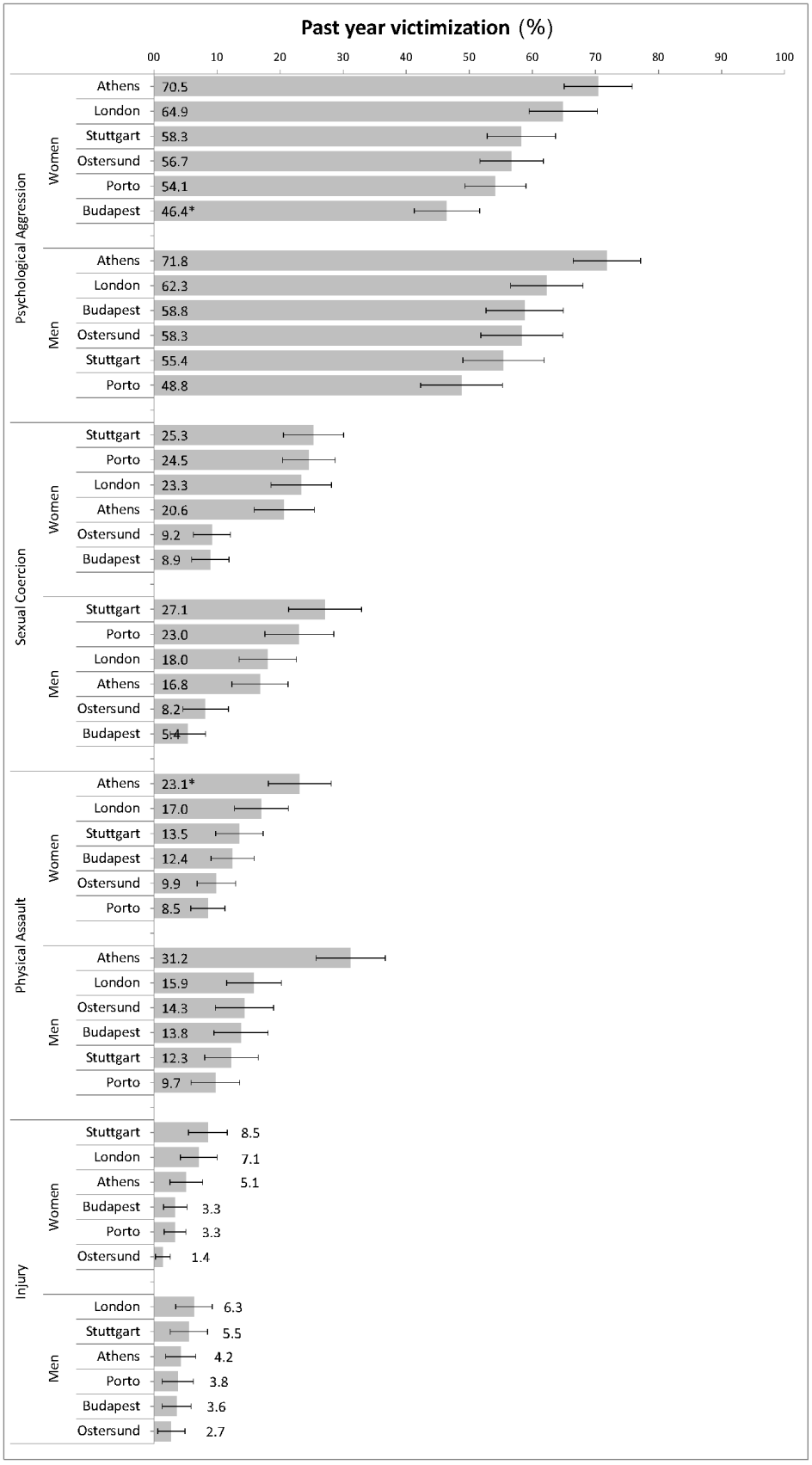
Porto presented the lowest rates of physical assault (women: 8.5%, 5.8-11.2%; men: 9.7%, 5.9-13.6%) and Athens the highest (women: 23.1%, 18.1-28.1%; men: 31.2%, 25.7-36.7%, p=0.040) (Figure 1). Severe acts in women ranged from 3.0% (1.1-4.9%) in Stuttgart to

14.7% (10.5-18.9%) in Athens and in men from 3.5% (1.1-5.9%) in Stuttgart to 19.6% (14.9-24.3%) in Athens (Figure 3).

Injury

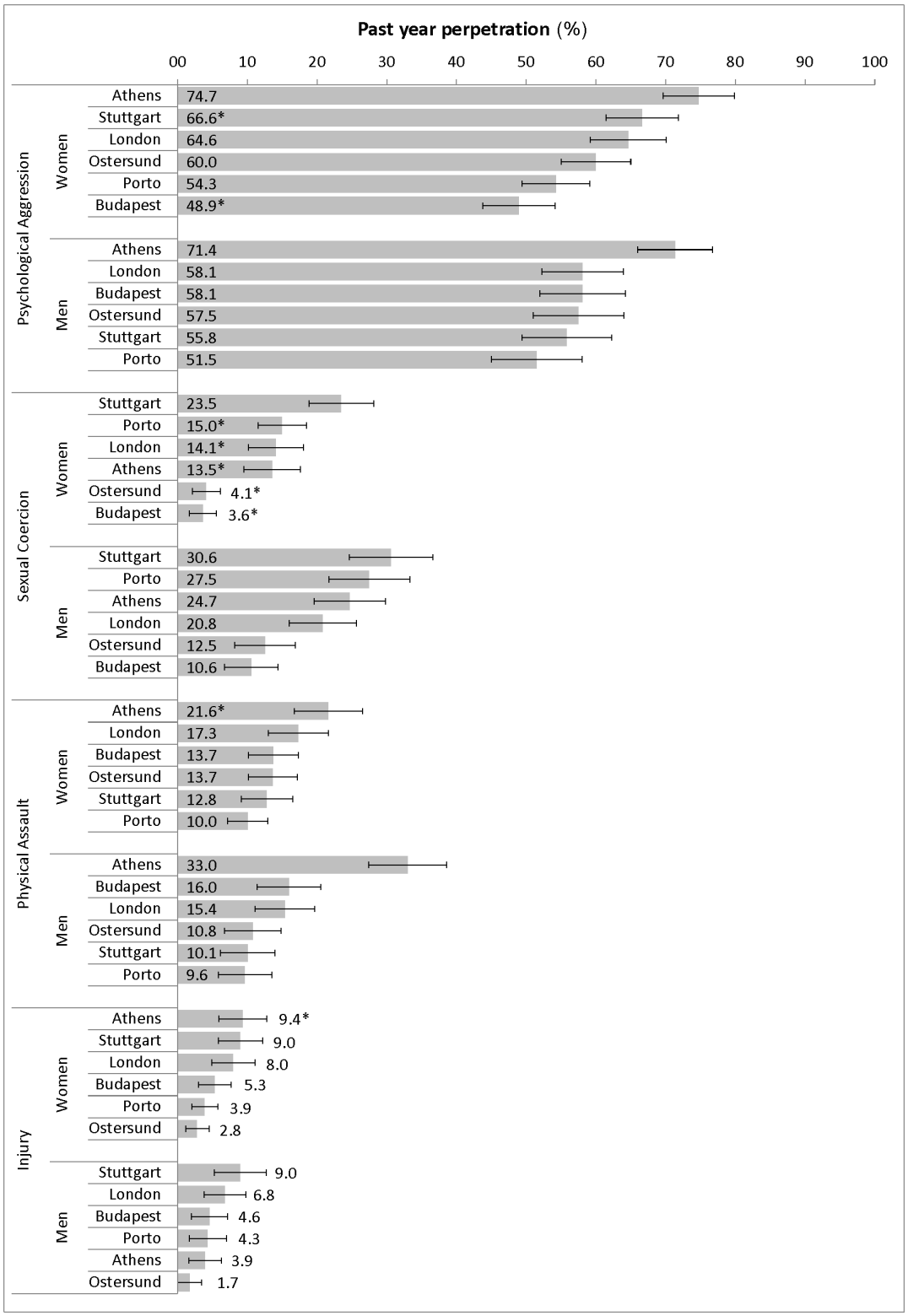
Women from Östersund reported the lowest prevalence of injury (1.4%, 0.2-2.6%) while the highest was in Stuttgart (8.5%, 5.5-11.6%) (Figure1). In men, estimates ranged from 2.7% (0.6-4.9%) in Östersund to 6.3% (3.4-9.2%) in London. Severe acts in women ranged from 0.3% (0.0-0.9%) in Östersund to 3.6% (1.5-5.7%) in London (Figure3). No severe cases were observed in Östersund while in London the prevalence was 3.7% (1.5-5.9%).

Figure 1. Past year age-standardized prevalence of acts of victimization (any severity), (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).



*p<0.05 for sex comparison of past year estimates within country; All other site comparisons for past year estimates were statistically significant, p<0.05; Error bars illustrate 95% confidence intervals.

Figure 2. Past year age-standardized prevalence of acts of perpetration (any severity), (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).



*p<0.05 for sex comparison of past year estimates within country; All other site comparisons for past year estimates were statistically significant, p<0.05; Error bars illustrate 95% confidence intervals.

Perpetration

Psychological aggression

Women perpetration ranged from 48.9% (43.7-54.1%) in Budapest to 74.7% (69.6-79.9%) in Athens while in men it ranged from 51.5% (45.0-58.0%) in Porto to 71.4% (66.9-76.7%) in Athens (Figure 2). Sex-differences were found in Stuttgart (women: 66.6%; men: 55.8%, p=0.019) and Budapest (women: 48.9%; men: 58.1%, p=0.030). Severe acts, in women and men, were less frequent in Östersund (6.0%, 3.6-8.4%, and 6.3%, 3.1-9.5%, respectively) and more frequent in Athens (30.0%, 24.6-35.4% and 39.1%, 33.3-44.9%) (Figure 4).

Significant sex-differences in severity of acts were noticed in Athens (p=0.009) and Stuttgart (p=0.039).

Sexual coercion

Budapest (women: 3.6%, 1.7-5.6%, men: 10.6%, 6.8-14.4%, p=0.002) and Stuttgart (women: 23.5%, 18.8-28.1%, men: 30.6%, 24.6-36.6%) presented the extreme rates and significant sex-differences were observed in all cities, except Stuttgart (p-values <0.001 in Porto and Östersund, p=0.001 in Athens and p=0.047 in London, Figure 2). Severe acts in women ranged from 0.3% (0.0-0.9%) in Östersund to 2.8% (0.9-4.7%) in London (Figure 4). No male cases were recorded in Stuttgart and Östersund, the prevalence in London being 5.0% (2.4-7.6%).

Significant sex-differences in severity of acts were observed in Porto (p=0.001), Athens (p=0.004), Östersund (p=0.001) and Budapest (p=0.002).

Physical assault

Women perpetration ranged from 10.0% (7.1-13.0%) in Porto to 21.6% (16.8-26.5%) in Athens, and by men from 9.6% (5.8-13.5%) in Porto to 33.0% (27.4-38.6%) in Athens (Figure 2). Severe acts perpetrated by women ranged from 1.1% (0.0-2.2%) in Östersund to 12.1% (8.3-15.9%) in Athens, and by men from 1.0% (0.0-2.3%) in Stuttgart to 21.8% (16.9-26.7%) in Athens (Figure 4).

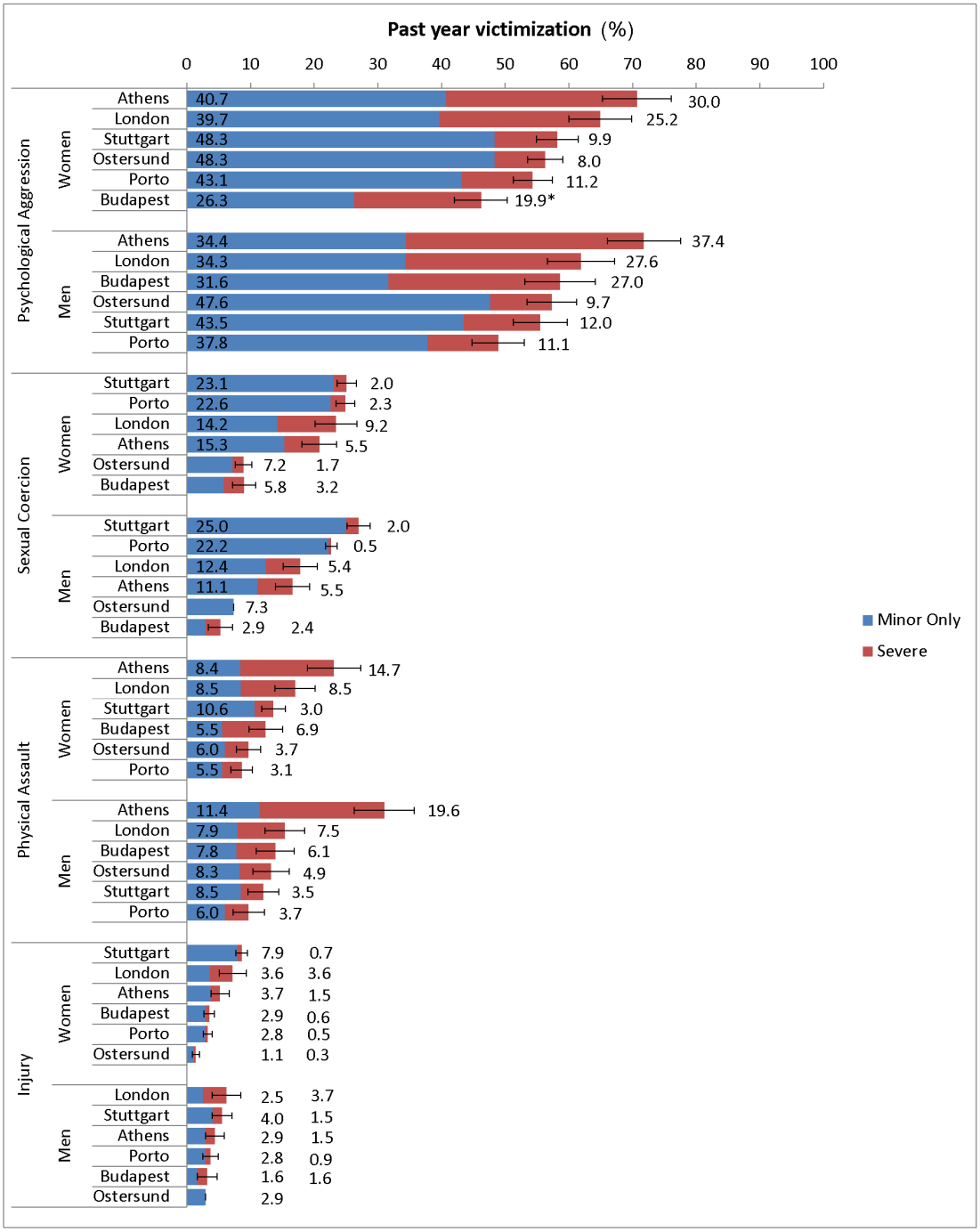
Significant sex-differences were found in Athens (p=0.004), with more male perpetration.

Injury

Women that perpetrated injuries ranged from 2.8% (1.1-4.5%) in Östersund to 9.4% (5.9-12.8%) in Athens, and from 1.7% (0.0-3.4%) in Östersund to 9.0% (5.3-12.7%) in Stuttgart regarding men, with significant sex-differences in Athens (women: 9.4%; men: 3.9%, p=0.019) (Figure 2). Considering women, severe acts ranged from 0.3% (0.0-0.9%) in Östersund to 5.0% (2.5-7.5%) in London (Figure 4). No male cases were recorded in

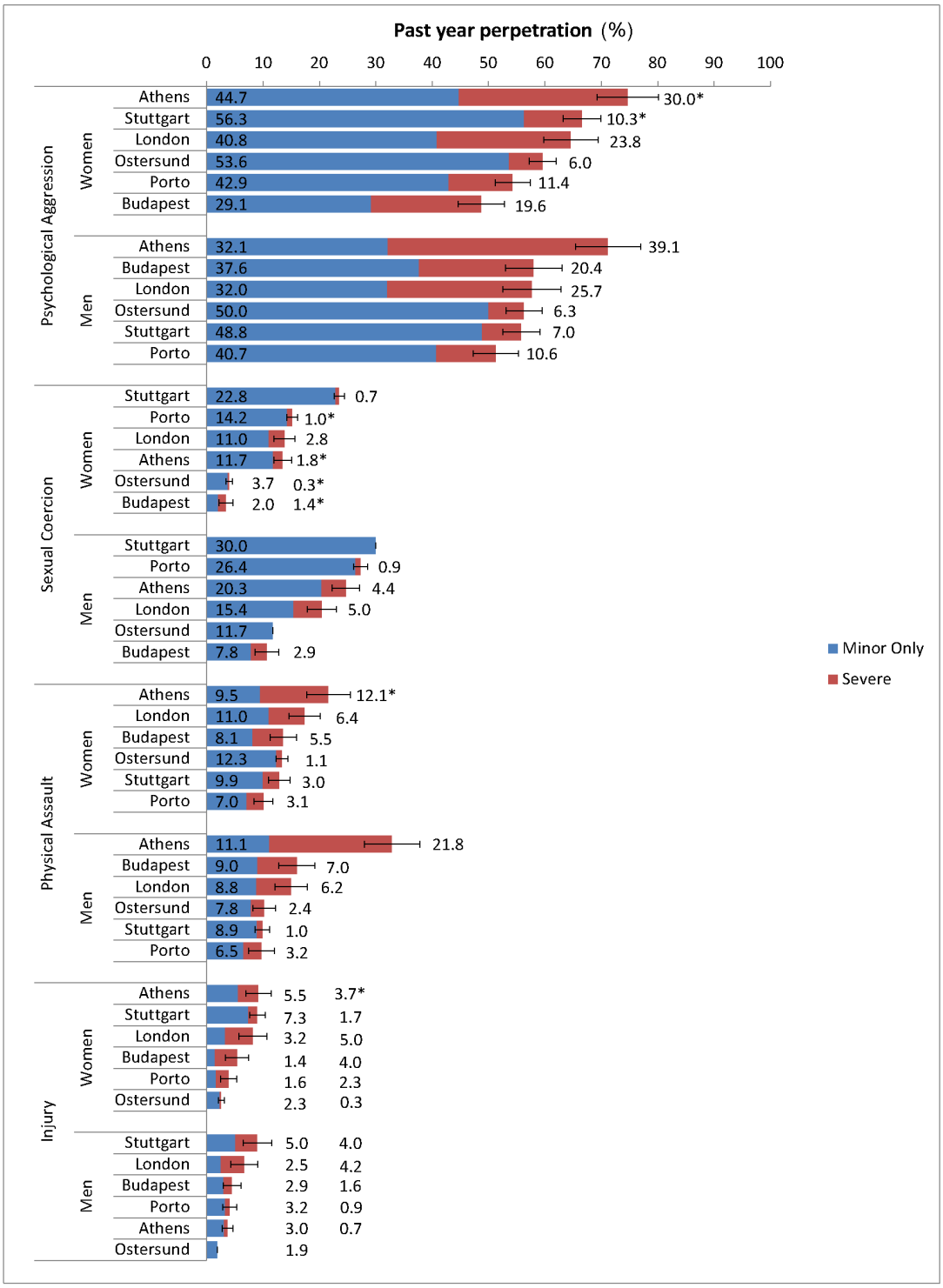
Östersund but the prevalence was 4.2% (1.8-6.6%) in London. In Athens, women significantly more frequently perpetrated minor and severe acts (p=0.021).

Figure 3. Past year age-standardized prevalence of acts of victimization (minor and severe acts), (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).



*Difference between men and women is statistically significant (p<0.05); Severe= counts participants who suffered at least one act of severe violence in the past year; Minor only= counts participants who declared being victims of only minor acts of violence in the past year; All site comparisons for past year estimates were statistically significant, p<0.05; Error bars illustrate 95% confidence intervals for severe acts.

Figure 4. Past year age-standardized prevalence of acts of perpetration (minor and severe acts), (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).



*Difference between men and women is statistically significant ($p<0.05$); Severe= counts participants who perpetrated at least one act of severe violence in the past year; Minor only= counts participants who declared being perpetrators of only minor acts of violence in the past year; All site comparisons for past year estimates were statistically significant, $p<0.05$; Error bars illustrate 95% confidence intervals for severe acts.

Directionality

Bidirectional or reciprocal (being involved as both victims and perpetrators) was the predominant pattern of violence (Supplementary Table 4). Significant sex-differences in the overall sample were observed for psychological aggression (only-victims, only-perpetrators and bidirectional IPV, respectively were, men: 4.1%, 3.5% and 54.5% vs. women: 2.0%, 5.0%, 54.4%, p=0.001) and for sexual coercion (men: 3.0%, 7.5% and 12.5 vs. women: 7.7%, 1.6% and 9.7%, p<0.001).

Chronicity of victimization

Violence was experienced repeatedly (Supplementary Tables 2 and 3). Considering the number of acts of severe psychological aggression victimization, significant sex-differences were found in Östersund (3.8% of women sustained at least one severe act 2-to-5 times and 4.1% of men sustained only once) and in London (12.4% of women were victims of a severe act more-than-5 times while 13.2% of men from 2-to-5 times).

For minor physical assault, significant sex-differences were found in Athens (10.1% of women were victims of one act more-than-5 times and 11.4% of men only once). Also in Budapest men and women differed (3.9% and 3.1% of women being victims 2-to-5 times and more-than-5 times, respectively, while men 4.8% once and 5.2%, 2-to-5 times). Sex-differences were also observed for severe physical assault in Stuttgart (2.2% of women were victims once and 2.2% of men 2-to-5 times). Significant sex-difference was found for minor injury in Athens (2.5% of women reported at least one act more-than-5 times and 1.8% of men reported only once).

Chronicity of perpetration

With few exceptions, chronicity of perpetration was similar within each city according to sex (Supplementary Table 3): in Budapest, more-than-5 minor psychological aggression acts were declared by 18.3% of women and 2-to-5 times by 27.8% of men. In Porto, 20.3% and 16.4% of women reported minor acts of psychological aggression from 2-to-5 times and more-than-5 times, respectively, while 28.6% of men reported them 2-to-5 times. Also in Porto, more-than-5 acts of minor sexual coercion were declared by 15.0% of men and 8.1% of women.

In Athens, men and women differed by minor physical assault (14.7% of men reported once and 5.8% of women) and severe injury (7 women reported to perpetrate one act once, while no men did).

Discussion

This study suggests that IPV is a frequent plight among men and women living in these European urban centers, and that its prevalence and relative proportion of types present large geographical variation. However, within each city, men and women presented equivalent prevalence of victimization and perpetration except for sexual coercion, more often perpetrated by men. Men and women experienced repeated episodes of IPV, be it "minor" or "severe", and reciprocal IPV was preponderant in all sites.

Intimate Partner Violence prevalence

Our prevalence estimates for physical IPV are similar to those reported in the US for the past 10 years (7, 27). However, we found higher estimates compared to those documented for the settings with higher incomes present in the WHO multi-country study (1), which were Japan (3.1% for physical IPV against women and 1.3% for sexual IPV) and Serbia and Montenegro (3.2% physical IPV and 1.1% sexual IPV). Our estimates were also higher when compared to those observed in the International Violence Against Women Surveys (IVAWS) European sites (28), for which past year physical IPV against women ranged from 1% in Denmark and Switzerland to 8% in Czech Republic.

European nation-wide studies of IPV in both genders have been conducted in the UK, Denmark and Sweden, although differences in study design and IPV definitions hinder comparisons. Nevertheless, the British Crime Survey (29) points to past year estimates of physical IPV against men of 1.3% and of 2.0% against women, whereas in Denmark (30) these were 6.4% in men and 5.0% in women, lower than our results. Two studies conducted in Sweden (through post), one using the WHO tool (31) and another using the CTS2 (32) showed that past year physical IPV against men was 7.6% and 11% respectively, and against women it was 8.1% and 8%, while sexual IPV male victims were 2.3% and 0.6% and female victims were 3.0% and 3.2%. Also a study conducted among women living in Germany (33) showed that 15% ever experienced physical violence and 17% experienced physical or sexual violence.

We considered acts of physical and sexual IPV, regardless of severity, which might partially explain our higher estimates. When we considered only "severe" acts of physical assault victimization, our results lay in the same range as those cited (Figure 3), except in Athens, showing a significantly higher prevalence.

No further recent comparable data were available for the other countries concerned and psychological IPV against men and women has been much less studied, mainly because of lack of agreement on standard measures and definitions (3).

Previous cross-cultural research on violence against women has suggested that societal factors such as attitudes towards IPV (cultural acceptance of violence as normative behavior)

(34) and country-level socioeconomic features (35), may explain country-differences observed in the status of women and men in society and thus relate to the cross-country variation in prevalence. Such factors might also explain the variation observed in our study, although the city-differences seemed specific to the type of violence: for example, physical assault was more reported by participants in Athens and less so in Porto, but this difference was reversed when reporting sexual coercion. This may be an interesting difference considering that Portugal and Greece present worse socioeconomic indicators and the lowest level of gender equality (36) compared to the other sites in the study. Other cultural specificities should be explored for each violence type in these industrialized settings.

Differences between Sexes

Within each city, the frequency of victimization and perpetration of psychological aggression, physical assault and injury was similar between men and women. A meta-analysis of 82 studies assessing aggression suggested that women were more likely than men to practice physical aggression acts and to do it more frequently while men were more likely to inflict injury (37). Our findings appear to confirm this, favoring theories of social roles that explain similarities in male and female IPV as a result of the evolving gender equality of western societies (38).

Additionally, sexual coercion perpetration was different between men and women. In the Swedish general population more past year sexual coercion victimization was also found in women (3.2% vs.0.6% with the use of the CTS2 (32) and 3.0% vs. 2.3% with the WHO tool (31)) while perpetration was declared by 5.2% of men and 0.8% of women. As with other self-reported sensitive and private issues, gender and country-specific stigma about IPV perpetration may impact on self-disclosure, although if this was the case, we would expect larger within-country differences than those noted. Likewise, using the CTS2 individual data (compared to couple data) to assess IPV may lead to underreporting, both in men and women, but even more in men (39, 40). However, such information pertains mainly to physical assault and if male reporting of sexual coercion was affected, the observed sex-difference would be wider.

Recent studies have reported that sex-differences might be only found in lifetime victimization and perpetration estimates when compared to past-year estimates, reflecting women's more severe experiences (31, 32). However, an analysis of lifetime prevalence for the four types of IPV assessed (Supplementary Tables 5 and 6) revealed the same cross-country differences as noted for past-year estimates and sex-differences within each site also followed the same pattern found for past-year estimates.

Chronicity

The chronicity of abusive acts helps to explain sex-differences according to the type of IPV. For instance, the construct of *intimate terrorism* describes a type of abuse repeatedly perpetrated by men against women, whereas *common couple violence*, suggested as typical of the general population, tends to be less severe and less frequent (41). As presented in Supplementary Tables 2 and 3, the frequencies of abusive acts of victimization or perpetration were similar in men and women for all IPV types, supporting a gender equivalence in IPV that favors social theories associating women's empowerment to the traditional profile assumed with their partners (42). However, our chronicity analysis pertains only to the abuse experienced during the previous year, not allowing to clearly test the presence of *intimate terrorism*, which might be underestimated in population-based studies with this type of approach (43).

Bidirectional violence

Previous studies suggested that IPV perpetration by both partners within a relationship is fairly common, but this was criticized under the assumption that differences would be revealed if the severity and repetition of acts was assessed (14). In our study, bidirectionality (being involved simultaneously as a victim and as a perpetrator) was accompanied by similar severity and chronicity confirming previous studies (44). The focus on the protection of women-victims and restriction of men-perpetrators has to evolve towards a general victim protection and restriction of perpetrators, continuing actions to prevent violence against women but raising awareness to prevent IPV on men.

Study limitations

We cannot rule out bias in prevalence estimates due to differences in sampling and data collection. We did not collect information on refusals or response rates. However, a comparison of participant's characteristics sampled from different sources, within the same city (performed in Porto and London) (18), suggests that the sampling method may not have biased participants' characteristics mix.

The CTS2 was self-completed without intervention of interviewers. Nevertheless, mailed questionnaires may have resulted in a lower disclosure, particularly if participants filled the questionnaire without privacy (namely with the presence of their partner) as opposed to the private setting ensured in sites where a trained interviewer introduced the questionnaire. This might explain the lower IPV rates observed in Östersund. However, in Stuttgart, IPV rates were amongst the highest, therefore, if any underestimation existed due to low disclosure induced by the post method, we would expect even higher prevalence estimates.

Regarding the use of telephone, bias might arise if landlines do not cover specific groups (ex: lower socioeconomic position). Only in Porto was this method used for recruiting and an older than expected population assessed. Our samples' age and educational profiles were compared with the general population characteristics' as provided by the respective National Statistics Institutes (five-age groups, by sex) and Eurostat country estimates (education) and a slight over-recruitment of older people in Porto, Östersund and Budapest and of more educated people in all sites was observed (18). Additional standardization for education did not affect the estimates (results not shown), and if residual confounding remained violence prevalence would be underestimated (45).

The CTS2 has been criticized for not measuring context-related features of IPV and only counting acts of violence. Contextual and meaning variables of interest should be the focus of further research efforts, assessed with separate valid instruments along with the CTS (46).

Conclusions

This is the first study reporting comparable data on four IPV types in six cities of six countries, contrasting adult men and women from the general population and detailing the perspectives of victims, perpetrators and of those declaring both. Even though different sampling techniques were used, all aimed to provide probabilistic samples of each city resident's and the remaining procedures that were taken account during the study design (sample size calculation allowing appropriate statistical power to determine IPV prevalence and cross-city comparisons, the use of the same training and standardized questionnaire in all centres) ensure the validity of these results.

The high prevalence rates and the variation observed in these European cities for psychological aggression, physical assault, sexual coercion and injury as types of IPV, emphasizes the significance of preventive interventions, given the well-known consequences to health associated with IPV. These results also emphasize the need to consider city-level characteristics that influence men's and women's reports of IPV. Similar prevalence estimates between men and women within the same city and the bidirectional or reciprocal pattern (being both a victim and perpetrator) observed in the experiences of psychological aggression, physical assault and injury must be considered in the design and the evaluation of preventive interventions.

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Conflicts of interest

None declared.

Key points

- Intimate Partner Violence (IPV) is a global major public health problem resulting in social and health adverse outcomes for women and men.
- Current knowledge on prevalence and determinants focus mainly women as victims and men as perpetrators, and emphasize physical abuse.
- A marked geographical variation was recorded among western developed countries for every type of violence.
- At each study site the rates of perpetration and victimization were similar and sex-related differences were only found regarding sexual coercion, with a male preponderance.

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Supplementary Materials

Items included in the Revised Conflict Tactics Scales

Examples of minor acts of violence are: “I insulted or swore at my partner” (psychological aggression), “I threw something at my partner that could hurt” (physical assault), “I made my partner have sex without a condom” (sexual coercion), and “I had a sprain, bruise, or small cut because of a fight with my partner” (injury). Examples of severe violence: “I destroyed something belonging to my partner” (psychological aggression), “I used a knife or a gun on my partner” (physical assault), “I used force (like hitting, holding down, or using a weapon) to make my partner have oral or anal sex” (sexual coercion), and “I passed out from being hit on the head by my partner in a fight” (injury).

The internal consistency of the CTS2 (Cronbach alpha) in the global sample, was 0.903 for victimization (from 0.825 in Budapest to 0.956 in London) and 0.896 for perpetration (from 0.748 in Östersund to 0.953 in London).

Supplementary Table 1. Demographic characteristics of participants, (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

				Education		Marital status				
	Number of participant	**Female**	**Age***	**Secondary**	**University**	**Single**	**Cohabiting**	**Married**	**Divorced/ Separated**	**Migrant background**
Athens – Greece	548	276 (50.4)	38.8 (12.6)	369 (68.5)	170 (31.5)	218 (39.9)	30 (5.5)	260 (47.6)	38 (7.0)	33 (6.0)
Stuttgart - Germany	546	318 (58.2)	41.9 (12.8)	230 (45.3)	278 (54.7)	157 (29.1)	78 (14.4)	266 (49.3)	39 (7.2)	111 (20.3)
Budapest – Hungary	604	356 (58.9)	40.8 (13.7)	449 (74.7)	152 (25.3)	157 (27.4)	86 (15.0)	222 (38.7)	108 (18.8)	30 (5.0)
Porto – Portugal	635	408 (64.3)	47.9 (12.9)	372 (58.8)	261 (41.2)	182 (29.4)	30 (4.9)	323 (52.3)	83 (13.4)	53 (8.4)
Östersund – Sweden	592	370 (62.5)	44.5 (13.2)	281 (49.3)	289 (50.7)	95 (16.2)	221 (37.8)	234 (40.0)	35 (6.0)	34 (5.8)
London – United Kingdom	571	298 (52.2)	38.5 (12.6)	237 (43.2)	312 (56.8)	180 (31.9)	88 (15.6)	201 (35.6)	95 (16.8)	147 (26.1)

Data are number (%) except for age *mean (SD); Participants indicating another place of birth than the country they lived in or another nationality were categorized as having a migrant background.

Supplementary Table 2. Chronicity of acts of victimization in the past year, (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

			Minor acts			Severe acts		
			once	2 to 5 times	> 5 times	once	2 to 5 times	> 5 times
	Study site		%	%	%	%	%	%
Psychological aggression	Stuttgart	Women	9.7	26.4	19.2	4.4	4.7	0.6
		Men	10.1	26.8	10.1	3.9	4.8	1.8
	Athens	Women	5.8	22.8	40.2	6.2	10.1	13.0
		Men	10.7	23.2	36.4	7.7	16.9	14.0
	Budapest	Women	9.6	15.4	18.0	6.7	6.7	5.3
		Men	10.5	24.6	19.8	8.9	14.9	4.0
	Porto	Women	9.8	20.8	15.7	4.7	3.2	3.2
		Men	8.8	23.3	10.6	1.8	4.0	2.2
	Ostersund**	Women	7.6	24.3	18.9	1.1	3.8	1.9
		Men	9.0	23.9	15.8	4.1	1.8	1.8
	London**	Women	8.4	24.5	28.2	4.4	8.1	12.4
		Men	7.7	27.8	18.7	5.5	13.2	6.2
Sexual coercion	Stuttgart	Women	2.5	4.1	16.7	0.9	0.6	0.3
		Men	0.4	3.9	18.4	0.0	1.8	0.0
	Athens	Women	3.6	8.3	8.7	0.4	2.9	2.2
		Men	2.9	5.9	5.5	1.5	1.8	2.6
	Budapest	Women	3.1	3.4	1.4	1.1	1.4	0.3
		Men	0.8	3.6	0.8	0.8	1.2	0.8
	Porto	Women	2.5	4.7	10.5	1.5	0.2	0.2
		Men	1.3	3.1	12.8	0.4	0.0	0.4
	Ostersund	Women	1.1	3.0	3.2	0.3	0.8	0.8
		Men	0.9	3.2	1.4	0.0	0.0	0.0
	London	Women	3.0	7.7	10.4	1.7	4.4	2.3
		Men	4.0	5.1	6.6	1.1	1.8	2.2
Physical assault	Stuttgart**	Women	4.4	6.0	1.6	2.2	0.3	0.3
		Men	4.4	3.9	1.3	0.4	2.2	0.4
	Athens*	Women	6.2	4.7	10.1	2.5	5.1	6.5
		Men	11.4	8.8	5.9	5.9	7.7	6.3
	Budapest*	Women	3.1	3.9	3.1	2.5	2.8	1.1
		Men	4.8	5.2	0.4	4.0	2.0	0.4
	Porto	Women	3.4	2.5	2.2	0.5	1.5	1.7
		Men	4.4	0.9	1.8	0.4	1.3	1.3
	Ostersund	Women	2.2	3.2	1.9	0.8	1.4	1.1
		Men	1.8	5.4	2.3	1.4	0.9	0.9
	London	Women	4.0	7.0	4.4	2.0	3.0	2.7
		Men	4.4	4.4	2.9	1.5	1.5	3.3
Injury	Stuttgart	Women	2.2	4.4	0.9	0.6	0.0	0.0
		Men	2.6	1.3	0.4	0.9	0.4	0.0
	Athens*	Women	0.0	1.8	2.5	0.7	0.0	0.7
		Men	1.8	0.7	0.4	0.4	1.1	0.4
	Budapest	Women	2.0	0.8	0.0	0.3	0.3	0.0
		Men	0.8	1.2	0.8	0.4	0.8	0.4
	Porto	Women	0.7	1.0	1.0	0.5	0.5	0.0
		Men	0.9	0.9	0.4	0.4	0.0	0.4
	Ostersund	Women	1.1	0.3	0.0	0.3	0.0	0.0
		Men	0.9	1.4	0.5	0.0	0.0	0.0
	London	Women	1.7	2.3	1.3	1.3	0.7	1.3
		Men	1.8	0.7	2.6	1.5	0.7	1.5

*p<0.05 for the comparison of minor violence in men and women; **p<0.05 for the comparison of severe violence in men and women.

Supplementary Table 3. Chronicity of acts of perpetration in the past year, (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

			Minor acts			Severe acts		
			once	2 to 5 times	> 5 times	once	2 to 5 times	> 5 times
	Study site		%	%	%	%	%	%
Psychological agression	Stuttgart	Women	12.9	30.5	19.5	4.7	4.1	0.9
		Men	11.8	27.2	8.8	3.5	1.8	0.9
	Athens	Women	7.2	26.8	38.0	7.6	9.1	13.4
		Men	9.6	25.0	35.7	8.8	13.6	17.3
	Budapest*	Women	10.7	17.1	18.3	5.9	7.6	5.1
		Men	12.5	27.8	15.3	9.3	8.1	3.2
	Porto*	Women	10.3	20.3	16.4	5.1	4.2	2.0
		Men	8.8	28.6	8.8	2.6	2.2	2.2
	Ostersund	Women	8.9	24.6	20.3	2.4	2.2	0.5
		Men	7.7	25.7	14.0	3.2	0.9	0.5
	London	Women	8.7	31.2	21.1	8.4	10.7	4.0
		Men	7.0	23.8	20.5	7.0	11.4	5.5
Sexual coercion	Stuttgart	Women	2.5	3.5	16.4	0.3	0.0	0.3
		Men	1.3	5.7	19.3	0.0	0.0	0.0
	Athens	Women	3.3	4.7	5.8	0.4	0.7	0.7
		Men	5.5	8.1	10.3	1.1	1.8	1.1
	Budapest	Women	0.8	0.6	1.1	0.6	0.6	0.3
		Men	1.6	6.0	2.0	0.0	2.4	0.8
	Porto*	Women	2.2	0.5	8.1	0.7	0.0	0.0
		Men	2.2	4.4	15.0	0.4	0.0	0.4
	Ostersund	Women	0.5	1.6	1.4	0.3	0.0	0.0
		Men	3.2	3.2	2.7	0.0	0.0	0.0
	London	Women	2.7	3.4	7.0	1.7	0.7	0.3
		Men	2.6	9.2	7.3	1.5	1.5	1.8
Physical assault	Stuttgart	Women	6.0	4.1	1.6	2.2	0.3	0.3
		Men	5.3	2.2	0.9	0.4	0.4	0.0
	Athens*	Women	5.8	6.2	6.9	2.5	4.0	5.4
		Men	14.7	6.6	6.3	8.8	5.5	7.4
	Budapest	Women	5.1	3.4	2.5	2.0	1.7	1.4
		Men	8.1	4.4	1.2	3.2	2.0	0.8
	Porto	Women	4.9	2.2	1.5	1.2	1.0	1.2
		Men	4.0	1.3	1.8	0.9	1.3	0.4
	Ostersund	Women	5.4	3.8	1.9	0.3	0.5	0.3
		Men	1.4	2.7	1.4	0.9	0.5	0.0
	London	Women	6.4	5.0	3.0	2.7	1.7	1.7
		Men	5.9	2.6	3.3	2.2	1.1	2.6
Injury	Stuttgart	Women	2.8	4.4	1.3	0.6	0.9	0.0
		Men	2.2	3.1	0.4	1.3	0.9	1.3
	Athens**	Women	1.4	3.6	3.3	2.5	0.0	1.1
		Men	1.8	1.1	0.7	0.0	0.7	0.4
	Budapest	Women	1.1	1.7	0.8	1.7	1.4	0.6
		Men	1.6	1.2	0.8	0.4	0.4	1.2
	Porto	Women	1.2	1.0	1.2	1.2	0.5	0.7
		Men	1.3	0.9	0.4	0.0	0.4	0.4
	Ostersund	Women	1.4	0.3	0.8	0.3	0.0	0.0
		Men	0.5	0.9	0.5	0.0	0.0	0.0
	London	Women	2.0	2.7	2.3	1.7	1.7	1.0
		Men	2.2	0.7	1.8	0.7	0.7	2.2

*p<0.05 for the comparison of minor violence in men and women; **p<0.05 for the comparison of severe violence in men and women.

Supplementary Table 4. Past year intimate partner violence directionality in men and women, by type of violence and city of residence, (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

		Psychological Aggression				Sexual Coercion			
		Victims only	Bidirectional	Perpetrators only		Victims only	Bidirectional	Perpetrators only	
Study site		%	%	%	p	%	%	%	p
Athens	**Women**	2.2	68.5	6.6	0.163	10.6	10.6	3.3	<0.001
	Men	3.7	68.3	3.0		7.4	10.3	14.4	
Porto	**Women**	2.3	47.5	3.4	0.622	10.2	9.9	1.6	<0.001
	Men	1.4	44.2	4.6		0.9	17.5	5.1	
Budapest	**Women**	2.3	42.9	4.6	<0.001	6.1	2.3	1.2	<0.001
	Men	7.0	52.3	6.6		2.5	3.7	7.8	
London	**Women**	2.5	63.4	2.5	0.172	11.1	12.5	1.8	<0.001
	Men	5.0	57.3	1.2		3.3	15.4	6.2	
Östersund	**Women**	2.0	52.1	4.9	0.051	4.9	3.7	0	<0.001
	Men	3.4	49.5	1.0		1.0	4.8	4.8	
Stuttgart	**Women**	0.7	57.9	8.6	0.006	3.9	21.1	2.3	0.132
	Men	4.0	51.2	4.5		1.5	25.5	4.5	
TOTAL	**Women**	2.0	54.4	5.0	0.001	7.7	9.7	1.6	<0.001
	Men	4.1	54.5	3.5		3.0	12.5	7.5	
		Physical Assault				**Injury**			
Athens	**Women**	4.4	19.0	3.3	0.035	1.5	3.7	5.5	0.144
	Men	3.3	28.4	5.2		2.2	2.2	2.2	
Porto	**Women**	2.3	6.5	3.1	0.605	0.3	2.6	1.6	0.552
	Men	2.3	6.0	1.4		0	2.3	0.5	
Budapest	**Women**	4.6	7.2	5.8	0.800	0.3	2.9	2.3	0.824
	Men	4.5	9.5	6.2		0.8	2.5	2.5	
London	**Women**	5.4	11.8	5.7	0.871	2.5	4.7	3.2	0.320
	Men	5.4	9.5	5.8		1.2	5.4	1.2	
Östersund	**Women**	1.7	7.2	5.2	0.021	0.3	1.1	1.4	0.306
	Men	4.3	6.7	1.0		1.4	1.4	0.5	
Stuttgart	**Women**	3.0	10.9	2.0	0.513	1.3	6.9	2.0	0.153
	Men	4.5	7.5	2.0		1.5	4.0	5.0	
TOTAL	**Women**	3.5	10.0	4.2	0.218	0.9	3.5	2.5	0.448
	Men	4.1	11.9	3.8		1.2	3.0	2.0	

Supplementary Table 5. Lifetime age-standardized prevalence of acts of victimization (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

	Psychological Aggression		Sexual Coercion		Physical Assault		Injury	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**
Athens	84.1 (79.7-88.4)	84.5 (80.2-88.8)	33.4 (27.8-38.9)	21.0 (16.2-25.9)*	35.7 (30.0-41.3)	39.7 (33.8-45.5)	7.5 (4.4-10.6)	7.4 (4.3-10.5)
Porto	66.9 (62.4-71.5)	62.9 (56.6-69.2)	32.9 (28.3-37.5)	27.0 (21.3-32.8)	16.9 (13.3-20.5)	14.5 (9.9-19.0)	4.9 (2.8-7.0)	4.9 (2.1-7.7)
Budapest	60.1 (55.0-65.2)	61.0 (54.9-67.0)	12.7 (9.2-16.2)	6.7 (3.6-9.9)*	20.2 (16.0-24.3)	18.9 (14.0-23.7)	7.4 (4.7-10.1)	4.6 (2.0-7.2)
London	75.9 (71.0-80.7)	79.0 (74.1-83.8)	33.7 (28.3-39.0)	37.4 (31.6-43.1)	27.3 (22.2-32.3)	28.0 (22.7-33.3)	11.9 (8.2-15.5)	14.5 (10.3-18.7)
Östersund	67.8 (63.0-72.5)	67.2 (61.0-73.4)	12.5 (9.2-15.9)	10.7 (6.6-14.7)	15.2 (11.6-18.9)	19.9 (14.6-25.1)	2.5 (0.9-4.1)	5.4 (2.4-8.3)
Stuttgart	71.2 (66.2-76.2)	66.0 (56.6-69.2)	32.6 (27.4-37.7)	36.2 (29.9-42.4)	18.6 (14.3-22.9)	22.4 (17.0-27.8)	10.4 (7.0-13.7)	8.4 (4.8-12.0)

*p<0.05 for sex comparison of lifetime estimates within country; 95%CI: 95% confidence intervals.

Supplementary Table 6. Lifetime age-standardized prevalence of acts of perpetration (conducted in Athens, Budapest, London, Östersund, Porto and Stuttgart during 2010-2011).

	Psychological Aggression		Sexual Coercion		Physical Assault		Injury	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Athens	88.6 (84.9-92.4)	84.4 (80.0-88.7)	20.0 (15.3-24.8)	33.6 (27.9-39.2)*	33.8 (28.2-39.3)	45.1 (39.1-51.0)*	12.5 (8.6-16.4)	7.8 (4.6-11.0)
Porto	69.0 (64.5-73.5)	66.4 (60.3-72.6)	19.2 (15.4-23.0)	34.7 (28.6-40.9)*	16.6 (13.0-20.2)	15.8 (11.1-20.5)	8.8 (6.1-11.6)	5.8 (2.7-8.8)
Budapest	61.7 (56.6-66.7)	65.3 (59.4-71.2)	4.2 (2.1-6.3)	13.7 (9.4-18.0)*	21.5 (17.3-25.8)	19.4 (14.5-24.3)	9.6 (6.5-12.7)	5.9 (3.0-8.9)
London	74.5 (69.6-79.5)	75.1 (69.9-80.2)	22.6 (17.9-27.4)	37.4 (31.7-43.1)*	26.4 (21.4-31.4)	28.2 (22.9-33.6)	14.5 (10.5-18.5)	12.9 (8.9-16.9)
Östersund	71.7 (67.1-76.3)	66.2 (60.0-72.4)	5.4 (3.1-7.6)	13.5 (9.0-18.0)*	18.6 (14.7-22.6)	14.8 (10.1-19.5)	5.5 (3.2-7.8)	3.4 (1.0-5.8)
Stuttgart	78.1 (73.5-82.6)	67.4 (61.3-73.5)*	28.8 (23.8-33.8)	38.7 (32.3-45.0)*	17.9 (13.7-22.1)	17.6 (12.7-22.5)	13.0 (9.3-16.7)	11.7 (7.5-15.8)

*p<0.05 for sex comparison of lifetime estimates within country; 95%CI: 95% confidence intervals.

4.4. Male and female physical intimate partner violence and socioeconomic position: a cross-sectional international multicentre study in Europe

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Abstract

Objectives: To explore the association between socioeconomic position (SEP) and intimate partner violence (IPV) considering the perspectives of men and women as victims, perpetrators and as both (bidirectional).

Design: Cross-sectional international multicenter study

Setting: Community non-institutionalized residents from six European cities: Athens, Budapest, London, Östersund, Porto and Stuttgart.

Participants: A sample of 3496 men and women, aged 18 to 64 years, randomly selected from the general population. Their education (primary, secondary and university), occupation (upper white, lower white and blue collar) and unemployment duration (never, ≤ 12 months and > 12 months) were considered SEP indicators.

Primary and secondary outcome measures: Physical IPV measured with the Revised Conflict Tactics Scales.

Results: Past year physical IPV was declared by 17.7% of women (3.5% victims, 4.2% perpetrators and 10.0% bidirectional) and 19.8% of men (4.1% victims, 3.8% perpetrators and 11.9% bidirectional). In women, low educational level (primary vs. university) was associated with victimization (adjusted Odds Ratio, 95% confidence interval: 3.0, 1.2-7.5) and with bidirectional IPV (4.1, 2.4-7.1). Blue collar occupation (vs. upper white) in women was associated with victimization (2.1, 1.0-4.5), perpetration (3.1, 1.4-6.8) and bidirectional IPV (3.9, 2.3-6.8). Unemployment duration was associated with male perpetration (in perpetrators with >12 months of unemployment vs. never unemployed: 3.4, 1.5-7.7) and with bidirectional IPV in both sex (women: 1.8, 1.2-2.8; men: 1.7, 1.0-2.8).

Conclusions: In these European centers, physical intimate partner violence is associated with a disadvantaged socioeconomic position. A consistent socioeconomic gradient was observed in female bidirectional involvement, but victims or perpetrators-only presented gender specificities according to levels of education, occupation differentiation and unemployment duration that may be useful for designing interventions.

Keywords: violence; gender; social inequalities.

Introduction

Exposure to intimate partner violence (IPV) is greater in more unequal societies (1). Similarly, from an individual perspective, the more disadvantaged is the socioeconomic position (SEP) the more frequently women and men are victims of violence (2). However, the nature and magnitude of the association between social determinants and violence depends on the type of indicator used (3, 4). Also, it is particularly important to know if similar determinants and pathways operate when considering separately the involved gender and the directionality of violence, taking victims, perpetrators and those that are both victims and perpetrators as different outcomes.

The relation between socioeconomic indicators and IPV has been essentially studied considering female victims (5-8). The World Studies of Abuse in the Family Environment consortium (WorldSAFE) addressed communities from Chile, Egypt, India and the Philippines and showed that a higher educational level protected women from physical assault (9). In the World Health Organization (WHO) multi-country study on women's health and domestic violence a protective effect was consistently observed across settings when both the woman and her partner had completed secondary education (10). A Spanish telephone survey of 2136 women living in Madrid region showed that unemployment increased physical violence victimization (5). Furthermore, secondary analysis of the 2008 British Crime Survey data demonstrated that individual and area social deprivation were associated with being a victim of any IPV among women but not generally among men (8). Similarly, a systematic review addressing the relationship between violent male partner behavior and low SEP concluded that more information and better quality data are required to establish conclusive results on the causal role of the socioeconomic status of men who batter their intimate partners (6).

Although bidirectional violence, which means to be both a victim and a perpetrator, is recognized as a common situation in IPV (11, 12) no study has addressed the role of socioeconomic indicators in its occurrence. Bidirectional IPV, compared to unidirectional IPV, has been linked with worse health outcomes (13, 14), but rarely measured in samples of adult men and women from the general population. To identify groups that are particularly vulnerable (as those socioeconomically disadvantaged) is of extreme importance for the design of public health interventions.

Thus, the DOVE project – [doveproject.eu], a study on IPV in the general population of diverse European cities, provided the opportunity to measure the association between SEP and past year prevalence of physical assault taking into consideration gender and the perspectives of victims, perpetrators and of those involved in violence as both.

Methods

Study population

This study analyses data obtained as part of the DOVE project (15). In brief, DOVE consisted of a cross-sectional multicenter study designed to measure the prevalence, determinants and consequences of IPV using samples of adult men and women, aged 18-64, drawn from the general population. For an expected IPV prevalence of 15% and 3.0% of relative precision, the sample size was calculated as 544 (272 women) per center, and proportionally stratified to follow the age and sex distribution of the resident population (2008 national data). For the purpose of the present investigation, we evaluated participants from Athens–Greece, Budapest–Hungary, Porto-Portugal, Östersund–Sweden, Stuttgart–Germany and London–United Kingdom. Registry-based sampling was used in Stuttgart (city municipality registries, total number of records n=3077), Östersund (state person address registry, number of records n=1996), Porto and London (electoral registry, number of records n=1990 in Porto and n=4720 in London) and random-route was performed in Athens and Budapest. In Greece, random route sampling was based on stratification of 4 major regions of the Greater Municipality Area of Athens according to geographical proximity of municipalities and similar socioeconomic structure. At each selected sampling point (building block) households were selected via k-step sampling. At each household, the member who had last his/her birthday was selected. In Hungary, streets were selected from localities in Budapest. A starting address was randomly selected and, taking alternate left- and right-hand turns at road junctions, every nth address was selected. An adapted Leslie Kish Key was used for participant selection at each household. As complementary sampling strategies, random-digit dialing was used in Porto (number of calls n=10623) and a via public approach in London (potential participants were approached in public settings and invited to the study, n=1280). Invitation letters with a concise description of the project were sent to participants selected based on registries and the study was presented by the interviewers as part of the invitation procedure to participants contacted through telephone or at their houses.

General information, namely socio-demographic characteristics was collected by face-to-face interviews except in Östersund where, due to local ethical decision, all questionnaires were mailed to be self-completed and returned using a pre-paid envelope. Mailed questionnaires were also predominantly used in Stuttgart (74.5% were mailed in Stuttgart), but were also present in Porto (14.0% mailed questionnaires) and London (3.5% mailed questionnaires). The final sample comprised 3496 participants, 1470 men and 2026 women.

Ethical considerations

The violence section of the questionnaire was self-administered in all sites and face-to-face interviews performed for the remaining sections of the questionnaire were only conducted if

privacy was assured. Where face-to-face contact was possible, a trained interviewer introduced the questionnaire to participants and let them fill it privately. They also provided participants with an envelope where the questionnaire was sealed and returned to the interviewer. The World Health Organization (WHO) ethical and safety guidelines for the conduct of research on violence against women were followed (16). Interviewers received instructions for conducting interviews in the presence of the participant alone. If privacy was not ensured, the interviewer would kindly apologize and stop the questioning.

In the case of posted questionnaires, a letter was sent detailing the study objective, the participant's selection procedures and explaining the anonymous character of responses. This letter also included the full names and contacts of the research team (telephone, e-mail), institution, funding agency and project website. The study protocol was approved by local Research Ethic Committees at each city. Signed informed consent was obtained from every participant that provided information by face-to-face interview.

Intimate Partner Violence

Past year physical intimate partner violence was measured using the physical assault scale (12 items) of the Revised Conflict Tactics Scales (CTS2) (17). Previously validated versions of the CTS2 were available in Portuguese, German and Swedish (18, 19). For the Greek and Hungarian versions, forward translation, revision by expert panel, back-translation, new expert panel revision and piloting was performed.

Respondents were asked to report their experience as victims and as perpetrators of physical assault regarding a current or former intimate partner. Ever-partnered participants included those in a dating, cohabiting or marital relationship for more than one month. Participants rated the frequency with which any particular event item happened during the previous year, with them as victims or perpetrators. Participants were classified according to the type of involvement reported as victims only, as perpetrators only, and as both victims and perpetrators if involved in bidirectional violence (11). Physical assault was considered regardless of the acts' severity and comprised such acts as throwing something at the partner that could hurt, twist partner's arm or hair, push, shove, grab, slap, punch or hit, choke, kick, slam against a wall, burn or scald on purpose, beat up and use a knife or gun.

Socioeconomic indicators

Information on socioeconomic characteristics was self-reported. Three variables were considered to approach socioeconomic position (SEP):

a) Educational level, defined according to the International Standard Classification of Education (ISCED) (20). For analysis, the categories considered were: primary or less

(ISCED 0 and 1), secondary and upper secondary or equivalent (ISCED 2, 3 and 4), university degree (ISCED 5 and 6);

b) Occupation, classified using major professional groups, according to the International Standard Classification of Occupations (ISCO-08) (21), and categorized into three groups: upper white-collar (groups 1, 2 and 3 of ISCO comprising executive civil servants, industrial directors and executives, professionals and scientists and middle management and technicians); lower white-collar (groups 4 and 5 of ISCO comprising administrative and related workers and service and sales workers); blue-collar (comprising farmers and skilled agricultural, fisheries workers, skilled workers, craftsmen and similar, machine operators and assembly workers and unskilled workers);

c) Unemployment duration, measured according to the three answering options offered to the question: How long have you been unemployed totally in your life: never; 12 months or less; more than 12 months?

Statistical analysis

Data analysis was performed separately for men and women. One-way ANOVA was used to compare means (age), and chi-square test was used to compare proportions (across levels of socioeconomic indicators, city of residence and type of involvement in physical assault).

Adjusted odds ratios and 95% confidence intervals (AOR, 95%CI) were computed to measure the association between past year physical assault and SEP indicators by fitting multivariate logistic regression models including age and city of residence as covariates. Models were stratified according to the type of involvement in violence (victims, perpetrators and bidirectional). Tests for linear trend of the log odds were computed for all models. Only participants with complete information were used in the regression models no imputation was made for missing data. Analysis was performed using the software SPSS v.21 and Stata v.11.

Results

As shown in Table 1, 3.5% of women and 4.1% of men were involved in past year intimate physical assault as victims, 10.0% of women and 11.9% of men declared bidirectional involvement, and 4.2% of women and 3.8% of men were involved as perpetrators. Women involved in IPV were less educated, and both men and women involved in IPV were younger, with less skilled occupations and more often unemployed than subjects not reporting violence involvement. The largest proportion of women declaring victimization-only was found in Budapest (23.9%) and London (22.4%). Bidirectional IPV was more common in Athens (26.9% in women and 46.7% in men) and the largest proportion of women

perpetrators-only was observed in Budapest (24.7%). London and Budapest presented the largest male prevalence of victims only (23.2% and 19.6%, respectively).

Table 1. Sample characteristics according to involvement in past year intimate partner violence (physical assault).

		Involvement in intimate partner violence									
		Women					Men				
		No	**Victims**	**Bidirectional**	**Perpetrators**	**p**	**No**	**Victims**	**Bidirectional**	**Perpetrators**	**p**
Age [mean (SD)]		43.6 (13.4)	42.8 (11.2)	38.9 (13.1)	36.9 (12.2)	<0.001	43.0 (12.9)	37.5 (12.8)	37.0 (12.7)	38.8 (11.5)	<0.001
Education n (%)	University	720 (46.5)	20 (32.3)	61 (32.1)	34 (42.0)	0.002	471 (43.7)	17 (32.1)	62 (38.0)	14 (28.0)	0.095
	Secondary	708 (45.7)	34 (54.8)	104 (54.7)	39 (48.1)		539 (50.0)	34 (64.2)	93 (57.1)	33 (66.0)	
	Primary	122 (7.9)	8 (12.9)	25 (13.2)	8 (9.9)		67 (6.2)	2 (3.8)	8 (4.9)	3 (6.0)	
	no information	143 (7.1)					127 (8.6)				
Occupation n (%)	Upper white collar	562 (44.5)	22 (38.6)	40 (30.1)	19 (31.1)	<0.001	442 (48.3)	14 (33.3)	35 (27.6)	15 (35.7)	<0.001
	Lower white collar	566 (44.8)	22 (38.6)	61 (45.9)	28 (45.9)		241 (26.3)	16 (38.1)	51 (40.2)	10 (23.8)	
	Blue collar	136 (10.8)	13 (22.8)	32 (24.1)	14 (23.0)		232 (25.4)	12 (28.6)	41 (32.3)	17 (40.5)	
	no information	511 (25.2)					344 (23.4)				
Unemployment duration n (%)	Never	850 (56.4)	28 (45.2)	70 (40.0)	31 (41.9)	<0.001	603 (56.7)	26 (48.1)	71 (46.7)	17 (36.2)	0.032
	≤12 months	402 (26.7)	15 (24.2)	61 (34.9)	29 (39.2)		311 (29.3)	18 (33.3)	52 (34.2)	19 (40.4)	
	>12 months	256 (17.0)	19 (30.6)	44 (25.1)	14 (18.9)		149 (14.0)	10 (18.5)	29 (19.1)	11 (23.4)	
	no information	207 (10.2)					154 (10.5)				
City of residence n (%)	Athens	200 (12.6)	12 (17.9)	52 (26.9)	9 (11.1)	<0.001	171 (15.4)	9 (16.1)	77 (46.7)	14 (26.9)	<0.001
	Porto	337 (21.2)	9 (13.4)	25 (13.0)	12 (14.8)		196 (17.7)	5 (8.9)	13 (7.9)	3 (5.8)	
	Budapest	284 (17.8)	16 (23.9)	25 (13.0)	20 (24.7)		194 (17.5)	11 (19.6)	23 (13.9)	15 (28.8)	
	London	215 (13.5)	15 (22.4)	33 (17.1)	16 (19.8)		191 (17.2)	13 (23.2)	23 (13.9)	14 (26.9)	
	Östersund	300 (18.8)	6 (9.0)	25 (13.0)	18 (22.2)		183 (16.5)	9 (16.1)	14 (8.5)	2 (3.8)	
	Stuttgart	256 (16.1)	9 (13.4)	33 (17.1)	6 (7.4)		173 (15.6)	9 (16.1)	15 (9.1)	4 (7.7)	
	no information	93 (4.6)					89 (6.1)				
Total n (%)		1592 (82.4)	67 (3.5)	193 (10.0)	81 (4.2)		1108 (80.2)	56 (4.1)	165 (11.9)	52 (3.8)	

p= p-value for one-way anova or chi-square test; SD= standard deviation.

Table 2. Associations (odds ratios and 95% confidence intervals) of past year intimate partner violence (physical assault) and socioeconomic indicators, by sex and according to the profile of violence involvement (victims, bidirectional, perpetrators).

		Women		
		Victims AOR (95%CI)	**Bidirectional AOR (95%CI)**	**Perpetrators AOR (95%CI)**
Age		1.0 (1.0-1.0)	1.0 (1.0-1.0)	1.0 (0.9-1.0)
Education	University	1.0	1.0	1.0
	Secondary	1.7 (0.9-3.0)	1.8 (1.2-2.5)	1.2 (0.7-2.0)
	Primary	3.0 (1.2-7.5)†	4.1 (2.4-7.1)†	2.0 (0.9-4.7)†
Occupation	Upper white collar	1.0	1.0	1.0
	Lower white collar	0.8 (0.4-1.5)	1.3 (0.9-2.1)	1.4 (0.8-2.6)
	Blue collar	2.1 (1.0-4.5)	3.9 (2.3-6.8)†	3.1 (1.4-6.8)†
Unemployment duration	Never	1.0	1.0	1.0
	≤12 months	1.1 (0.6-2.1)	1.5 (1.0-2.1)	1.7 (1.0-2.9)
	>12 months	2.2 (1.2-4.1)†	1.8 (1.2-2.8)†	1.6 (0.8-3.1)
City of residence	Athens	1.0	1.0	1.0
	Porto	0.4 (0.2-1.1)	0.3 (0.2-0.6)	1.0 (0.4-2.5)
	Budapest	0.9 (0.4-2.0)	0.4 (0.2-0.6)	1.7 (0.7-3.7)
	London	1.2 (0.5-3.6)	0.6 (0.4-0.9)	1.5 (0.6-3.6)
	Östersund	0.3 (0.1-0.9)	0.3 (0.2-0.6)	1.5 (0.7-3.5)
	Sttutgart	0.6 (0.2-1.4)	0.5 (0.3-0.8)	0.5 (1.2-1.6)
			Men	
Age		1.0 (0.9-1.0)	1.0 (1.0-1.0)	1.0 (1.0-1.0)
Education	University	1.0	1.0	1.0
	Secondary	1.8 (1.0-3.4)	1.1 (0.8-1.6)	1.8 (0.9-3.4)
	Primary	1.2 (0.3-5.4)	1.5 (0.6-3.4)	2.6 (0.7-10.3)
Occupation	Upper white collar	1.0	1.0	1.0
	Lower white collar	2.1 (1.0-4.6)	1.6 (0.9-2.7)	1.0 (0.4-2.3)
	Blue collar	1.7 (0.8-4.0)	1.6 (1.0-2.6)	1.6 (0.7-3.4)
Unemployment Duration	Never	1.0	1.0	1.0
	≤12 months	1.2 (0.7-2.3)	1.3 (0.9-2.0)	2.2 (1.1-4.4)
	>12 months	1.8 (0.9-4.0)	1.7 (1.0-2.8)	3.4 (1.5-7.7)†
City of residence	Athens	1.0	1.0	1.0
	Porto	0.7 (0.2-2.0)	0.2 (0.1-0.4)	0.2 (0.1-0.8)
	Budapest	1.2 (0.5-2.9)	0.3 (0.2-0.5)	1.0 (0.5-2.1)
	London	1.4 (0.6-3.3)	0.3 (0.2-0.5)	0.9 (0.4-2.0)
	Östersund	1.3 (0.5-3.3)	0.2 (0.1-0.4)	0.2 (0.0-0.7)
	Sttutgart	1.1 (0.4-2.9)	0.2 (0.1-0.4)	0.3 (0.1-0.9)

AOR= adjusted odds ratio (95% confidence interval); Age and city of residence were included in all adjusted models; †p-value for trend in AOR statistically significant (p<0.05).

Compared to those with a university degree, and after adjustment for age and city of residence, women with primary education were more frequently involved in IPV as victims-only (AOR, 95%CI=3.0, 1.2-7.5), Table 2. Female involvement in bidirectional violence increased with decreased education (secondary level: 1.8, 1.2-2.5; primary education: 4.1, 2.4-7.1).

In women declaring perpetration-only, a non-significant increase in risk with decreasing education was observed. However, a significant linear trend for increased violence with decreased education was observed regardless the profile of IPV involvement.

Compared to upper white-collar workers, women in blue-collar occupations were more often victims (2.1, 1.0-4.5), perpetrators (3.1, 1.4-6.8) and involved in bidirectional IPV (3.9, 2.3-6.8). A significant trend was observed for the association between occupational level and perpetration-only and bidirectional IPV.

Compared to never unemployed women, those who had been unemployed for more than 12 months presented increased odds of victimization-only (2.2, 1.2-4.1) and of involvement in bidirectional IPV (1.8, 1.2-2.8).

Men who had been unemployed for more than 12 months, compared to never-unemployed men presented increased odds of involvement in bidirectional (1.7, 1.0-2.8), and perpetration-only IPV (3.4, 1.5-7.7). No other statistically significant association was found for men.

Discussion

This multicenter, cross-sectional, European study showed that socioeconomic position (SEP) was associated with the occurrence of physical past year intimate partner violence, with disadvantageous social positions being associated with an increased prevalence of physical assault. However, this general pattern does not stand when we consider gender, violence profile and social indicator.

Low education and low occupational status were significantly associated with female victimization and bidirectional intimate partner violence. Unemployment duration was associated with female victimization, male perpetration and with bidirectional intimate partner violence in both sexes.

The strengths of this study included the analysis of a large population-based European sample of men (n=1470) and women (n=2026) with a common measure of intimate partner violence (IPV). These particular cities were assessed because of the past experience of the research consortium, whose members are established in these regions.

The different sampling procedures taken in each city may be a source of selection bias, although previous analysis showed that within cities where two different strategies were employed (Porto and London), different sampling procedures resulted in similar characteristics (15). Refusals data and response rates were not possible to collect. We expected that face-to-face contact in recruitment (as was the case of our Greek, Hungarian, and British participants) or the use of telephone for recruitment (as Portuguese participants) contributed to higher participation rates, when compared with participants only contacted through post (100% in Östersund, and 75% in Stuttgart). Nevertheless, our previous analysis revealed that we interviewed a proportionally more educated sample, compared to the

national population in all centers, and that participants recruited were slightly older than the resident population in Porto, Östersund and Budapest, which might have resulted in an overall underestimation of violence. Besides the variation in disclosure of violence exposure and perpetration that may incur from the different data collection methods used, the influence of culturally determined norms and attitudes towards violence was not assessed. Our models were adjusted for city of residence expecting that the associations between IPV and SEP indicators holds across these heterogeneous societies (from the ones considered more gender-egalitarian such as the Swedish society, to those expected more patriarchal, such as the Portuguese, even if represented by small-sized cities). A drawback of this approach is that we are unable to show regional specificities of the relations explored. The cross-cultural consistency of the associations explored, despite stressing the need for European-level initiatives to tackle IPV, do not diminish the need for focused national assessments and for cross-regional comparisons.

Focus was exclusively on physical IPV, which, together with sexual violence is one of the most commonly measured types of violence in studies using general population samples (22). Other types of IPV, sexual or psychological, might be differently linked to SEP. However, victimization and perpetration of different violence types (physical, sexual, psychological) may overlap (23), which increases the difficulty of analyzing factors specifically associated with each violence type.

The definition of bidirectional violence used in this study (having been both a victim and perpetrator of at least one act of physical assault during the previous year, at some point and not necessarily at the same occasion) does not consider the context and, motive, chronicity or severity of violent acts. Hence, there may be different dynamics underlying male and female involvement in violence in these samples that should be further explored. We measured the chronicity of acts (number of times each act occurred during the previous year) among those experiencing bidirectional violence, stratified by acts of victimization and perpetration. We found that women suffered more minor acts of physical assault than men, and no other sex-difference for minor or severe acts was noted (this is presented in Supplementary Table 1).

Still, culturally defined gender roles may determine that women put more blame on themselves for their own use of violence even if it happened only once during the previous year in a context of self-defense, while men may disclose a common victimization and perpetration with more ease. Therefore, we cannot rule out the potential for a reporting bias, particularly for male perpetration reports (24). Likewise, the lack of perceived support or shame experienced by those in a disadvantaged socioeconomic position may also lead to underreporting of violence experiences.

A strength of this study was the use of three indicators of SEP. In the study of inequalities, various indicators are linked to individual proximate determinants of health, thus a single measure of SEP is unlikely to capture adequately its multiple dimensions that may have an independent influence on outcomes (25). Relatively few studies have compared multiple indicators of SEP simultaneously or in a multivariate analysis in cross-national studies. These results are however difficult to draw firm conclusions from since occupation compositions and educational systems differ across nations. The present study used international classification systems for education and occupations to maximize comparability across nations, even though changes in educational attainment and occupational composition might have differed within European states during the past years.

We did not measure the influence of neighborhood SEP characteristics on the relation between individual SEP and IPV. The neighborhood SEP composition has been shown to influence the relation between individual SEP and attitudes towards violence against women in sub-Saharan Africa (26), but no influence of neighborhood SEP characteristics has been found on the risk of IPV against women in Sao Paulo, Brazil (3). Future studies should measure and test such contextual impact in these European urban centers.

Finally, the cross-sectional nature of this study does not allow to draw inferences on causality. However, two of the indicators used to measure the SEP of participants (which are inherently correlated), may be thought of as preceding past year physical assault once they are acquired by early adulthood (educational level) and are less likely to diminish over time (the social status and power measured by the occupational level) (27).

The results we obtained among women are in line with the evidence linking lower educational levels with female physical assault victimization (10). Although clarity on which mechanisms explain the relation is still needed, higher levels of schooling seem to improve individual's ability to obtain and effectively use information, improves decision-making and problem-solving skills, including motivation, persistence and self-control and the ability to cope with stressful life events (28). Thus, for women involved in violence, education facilitates their escape from violent relationships and help-seeking (29).

Less evidence exists linking occupational class and physical assault (6). Earlier perspectives root IPV in societal patriarchy and the social power imbalance observed between men and women would be one of the main determinants of male-to-female IPV (4). Violence as a compensatory behavior to make up for men's lack of power in other areas of life such as in his occupation (30) would explain higher battering rates in men with less skilled occupations. In our results, only in women was the association between IPV and occupation evident particularly for those declaring bidirectional IPV or perpetration-only, which might be the

result of different mechanisms that operate among these western European urban women (31).

Male unemployment has also been documented as a risk factor for physical violence against women (6, 7). The stress associated with unemployment may increase the risk of violence, but it may also be hypothesized that unemployment is a consequence of abuse present in both sexes, even though unemployment has been suggested as more detrimental for men than women and directly linked to the mechanism of male social approval and status production (32).

With the increasing awareness to gender equality that have marked European societies for several years (33, 34), it is possible that women are gaining increasing power in roles typically occupied by men, in social, political and economic areas, thus the shift in gender roles may include violent acts in intimate relationships (35, 36), with women being affected by the same power seeking mechanisms thought to explain male's dominance (12), except in the case of unemployment, that may still affect more profoundly male's subjective well-being (32), facilitating his use of violence.

More broadly, the relation of IPV and SEP is congruent with the established knowledge from social epidemiology linking other types of interpersonal violence (violent crime, homicide), with inequality (37). Socially disadvantaged people compete more for social status and social respect, and physical violence, therefore, is more frequently used in the struggle for social resources (1). Our results are also consistent with studies documenting male use of controlling behaviors and dominance as main determinants for their perpetration in male-to-female IPV (38). The female perpetration observed, is in line with studies reporting gender equivalence in risk factors for IPV perpetration (39), even though motives for female perpetration may be different (e.g. self-defense).

Bidirectionality of intimate partner violence, and in particular, of physical acts of violence, is frequent and disproportionally present among European adults characterized by a disadvantaged socioeconomic position. EU policy makers are already aware and taking action over health inequalities and the socioeconomic determinants of health, but should also consider experiences of IPV as an additional source of susceptibility among those considered most vulnerable.

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Contributorship Statement

DC, EH, EI, JL, JS, OS, OT and HB were involved in the research design and data collection procedures. DC performed the statistical analysis of this manuscript and wrote the first draft of the paper. All authors revised the manuscript critically for important intellectual content. All authors approved the final version of the manuscript.

Competing Interests

None declared.

Data Sharing Statement

No additional data are available.

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Supplementary Table 1. Chronicity* of acts among participants experiencing bidirectional physical intimate partner violence.

		Victims		Perpetrators	
		Mean (s.d.)	p**	Mean (s.d.)	P**
Women	Minor acts	13.5 (22.1)	0.005	8.3 (13.9)	0.255
	Severe acts	9.2 (21.7)	0.879	4.2 (10.0)	0.199
	Total	22.7 (41.3)	0.059	12.5 (21.3)	0.770
Men	Minor acts	7.6 (12.5)		7.4 (12.1)	
	Severe acts	6.0 (16.4)		5.6 (14.9)	
	Total	13.6 (26.7)		13.0 (24.8)	

s.d.= standard deviation;
*Among participants who engaged in one or more acts of violence in the previous year, we added the midpoints for the frequency categories chosen and summed these acts for each type of violence. The midpoints considered were accordingly: one, two, four, eight, 15 and 25, as suggested by the original scale' author;
**The mean number of violent acts were computed according to violence involvement and severity subscales. Mann-Whitney U was used to compare the number of minor, severe and total acts by sex.

4.5. Intimate partner violence and health-related quality of life in European men and women: findings from the DOVE study

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Intimate partner violence and health-related quality of life in European men and women: findings from the DOVE study

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Abstract
Purpose Little is known on the specific relation between being a perpetrator or both a victim and perpetrator of intimate partner violence (IPV) and health-related quality of life (HRQoL). We assessed the association between HRQoL and abuse, considering men and women as victims, perpetrators or reciprocally.
Methods Participants were adult men and women ($n = 3{,}496$), randomly selected from the general population of six European cities. The Revised-Conflict-Tactics-Scales and the Medical-Outcomes-Study 36-item Short-Form Health Survey (SF-36) were used to measure IPV and HRQoL. The age-, education-, and city-adjusted mean scores[standard error] of the physical and of the mental SF-36 component summaries were used to compare victims-only, perpetrators-only, and those involved in both (bidirectional or reciprocal cases) with those not involved in past-year and lifetime physical assault and/or sexual coercion.
Results The physical component summary was significantly lower in women involved in past-year bidirectional physical assault compared with non-abused women. The mental component summary in women not involved in IPV was significantly higher than in those physically abused, regardless of type of involvement. Women victims-only of past-year sexual coercion and victims or involved in bidirectional concomitant physical and sexual IPV also presented lower scores in the mental component summary than women not involved in IPV. In men, significantly lower scores in the mental component summary were found in the past-year bidirectional physically assaulted group and among those involved bidirectionally in both physical and sexual IPV compared with men not involved in IPV.

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Conclusion Experiencing physical and sexual IPV is negatively associated with HRQoL. Lower scores in the mental component summary of the SF-36 are evident among female victims and among males and females involved in intimate partner violence as both victims and perpetrators when compared to females and males not involved in violence.

Keywords Intimate partner violence · Europe · Multicenter study · Health-related quality of life

Introduction

Quality-of-life is an important outcome measure in routine clinical practice and in research [1]. More specifically, health-related quality-of-life (HRQoL) involves perceptions of well-being and functioning in physical, mental, social, and daily life activities that comprise a summary quantification of perceived health [2]. Health-related quality of life is a quantitative summary measure of the effect of a condition on individual's lives, and it provides an estimate of the potential benefit of interventions. Health-related quality of life is useful in decision making on prioritization of resources across competing programs and interventions [3].

Intimate partner violence (IPV) is a human rights violation. It is a major public health problem [4], defined as any physical, sexual, or psychological harm inflicted by a current or former partner. Worldwide, more than 30 % of women are victims of IPV [5]. Less is known about male victimization, but the published data, mainly from English speaking populations, pointed to a 25 % prevalence [6].

Short- and long-term adverse physical and mental health consequences of IPV [4, 7], including a decreased HRQoL [8, 9], have often been reported, but focused only in victims [9–11]. However, reciprocal or bidirectional violence, defined as involvement as both a victim and perpetrator, is thought to be the most commonly identified profile of IPV when dealing with general population samples [12], although previous studies looking at bidirectional IPV mainly dealt with university student samples or adolescent samples from the US [13, 14]. Studies performed with clinical samples suggested that bidirectional IPV is more strongly associated with adverse health outcomes than unidirectional violence [15, 16]. Exploring the experiences of victims and perpetrators might also elucidate different sex patterns of associations, as shown in a large Canadian cross-sectional telephone survey, where depressive symptoms were more often reported by female victims and male perpetrators [17].

The association between HRQoL and the type of involvement in IPV remains poorly described, and to the best of our knowledge, it was never assessed using a multiple country sample. With the present investigation, we explored in a general population sample of men and women living in six European cities how experiencing abuse as victims, perpetrators or reciprocally is associated with HRQoL.

Methods

Participants

We used data collected as part of the DOVE project (http://doveproject.eu), a European multinational research project designed to evaluate the frequency of IPV and health-related associated factors. In the present study, participants were non-institutionalized adult men and women (aged 18–65), national citizens or documented migrants, sampled from the general population of six cities (Athens—Greece, Budapest—Hungary, London—United Kingdom, Östersund—Sweden, Porto—Portugal and Stuttgart—Germany) although two other cities (Ghent, Granada) were initially thought but could not reach the targeted sample size [18].

Random sample lists were obtained through city's municipality registries in Stuttgart, through the electoral registry in Porto and London and through the state person address registry in Östersund. Additional sampling strategies included random-digit dialing in Porto and a via-public approach in London. Random route was used in Athens and Budapest. We previously described and discussed the design, methods, procedures, and characteristics of the samples in comparison with the resident population [18]. The final sample comprised 3,496 participants, 1,470 men and 2,026 women.

A questionnaire was developed, comprising information on socio-demographic characteristics, intimate relationships, physical, and mental health. In all cities, the IPV section was self-administered and, except for Östersund, face-to-face interviews were conducted for the remaining topics. In Östersund, the local ethics committee required all questionnaires to be mailed with a prepaid envelope for return. In Porto, London, and Stuttgart, if participants were otherwise unreachable or explicitly asked for it, questionnaires were also mailed to their homes following the same procedure. The World Health Organization (WHO) ethical and safety guidelines for the conduct of research on violence against women were followed [19]. In the case of posted questionnaires, a letter was sent detailing the study objective, the participant's selection procedures, and explaining the anonymous character of responses. It also included the full names and contacts of the research team (telephone, e-mail), institution, funding agency, and project website. The study protocol was approved by a Research Ethic Committee in each center. Data collection lasted approximately 9 months and ended in May 2011.

Outcome measure

The outcome measure was the physical and mental component summaries derived from the eight domains of the Medical-Outcomes Study 36-item Short-Form Health Survey (SF-36) [20]. The SF-36 as a measure of health-related quality of life refers to functional health and well-being in the previous 4 weeks and has been widely tested and used in several countries, namely in all the countries represented in this study [21–26].

The physical and mental component summaries of SF-36 were computed following recommendation for their use in multinational comparisons [27]: All eight domains of the SF-36 (physical functioning, physical role functioning, bodily pain, general health, vitality, social functioning, emotional role functioning, and mental health) were standardized using a linear *z*-score transformation obtained by subtracting domain means for the general US population from each domain score in our sample and dividing the difference by the standard deviation of the US population; these *z*-scores were then multiplied by the component factor score coefficient for physical and mental health summaries as obtained from the factorial analysis extracted for the US population and summed over the eight domains; the resulting physical and mental summary scales sums were then t-scored (multiplied by 10 and added 50). The higher the scores, the better expected HRQoL.

Exposure measure

The physical assault and sexual coercion subscales of the Revised Conflict Tactics Scales (CTS2) were used to define exposure to physical and/or sexual IPV [28]. The CTS2 was originally developed in English and has been used in more than 100 studies, including in multinational comparisons. It was previously validated to Portuguese, German, and Swedish populations [29, 30]. Translations to Greek and Hungarian followed a standard protocol: forward translation, expert panel revision, back-translation, new expert panel revision, and piloting. The internal consistency of the CTS2 (Cronbach alpha) in our sample was 0.903 for victimization (ranging from 0.825 in Budapest to 0.956 in London) and 0.896 for perpetration (ranging from 0.748 in Östersund to 0.953 in London), in line with previous reliability analysis [30].

The CTS2 physical assault and sexual coercion subscales comprise, respectively, 12 and 7 specific acts or behaviors. It include minor acts (examples: "I threw something at my partner that could hurt," "I made my partner have sex without a condom") and severe acts (examples: "I used a knife or a gun on my partner," "I used force (like hitting, holding down, or using a weapon to make my partner have oral or anal sex"). For each act, participants are asked whether they have been victims or perpetrators and they are given an 8-options scale to mark if it happened: never, once in the past year, twice, 3–5, 6–10, 11–20, more than 20 times or ever but not in the past year. When all items describing each type of violence were answered as "never," the participant was coded as a never victim or never perpetrator. To overcome the skewed time frequency response distribution, participants were recoded as victims-only, perpetrators-only or as involved in bidirectional violence.

Socio-demographic factors

Age was classified in 5 years groups: 18–24, 25–34, 35–44, 45–54, 55–64, and educational level in three: primary level, secondary level, university degree, according to completed stage of schooling.

Statistical analysis

T test and ANOVAs were used to compare mean scores (standard deviation) of the physical and mental component summaries of the SF-36 according to sex, age-groups, educational level, and city of residence. Chi-square test was used to compare the proportions.

The mean (standard errors) of the physical and mental component summaries of the SF-36 by type of involvement in violence were computed by fitting linear regression models. Models were adjusted for age, education, and city of residence and computed for physical assault, sexual coercion, and for concomitant physical assault and sexual coercion. We considered separately the experiences of past-year IPV and of having ever experienced IPV. We tested the interaction of sex and IPV by including the interaction term for each violence type. As there was a statistically significant interaction, we stratified the analysis by sex.

We then performed a pair-wise comparison of each estimated mean with the group declaring "no violence" using a Bonferroni correction.

From the 3,496 participants, there was missing information for physical assault in 182 (5.2 %), for sexual coercion in 183 (5.2 %) and 2 (0.1 %) did not provided the SF-36 evaluation. Only participants with complete information were used in the regression models, and no imputation was made for missing data.

An additional analysis was performed considering a measure of chronicity of abusive acts and is provided as supplementary material. Among participants who engaged in one or more acts of violence in the previous year, we added the midpoints for the frequency categories chosen and summed these acts for each type of violence. The midpoints considered were accordingly: one, two, four,

Table 1 Sample characteristics and mean scores for the SF-36 physical and mental component summaries according to socio-demographics

	Women	Men	Physical health		Mental health	
	n (%)	*n* (%)	Women Mean (SD)	Men Mean (SD)	Women Mean (SD)	Men Mean (SD)
Age						
18–24	253 (12.5)	181 (12.3)	54.15 (5.61)	56.14 (5.39)	48.07 (10.71)	51.93 (8.15)
25–34	396 (19.5)	315 (21.4)	53.43 (6.60)	54.33 (6.65)	47.66 (9.77)	50.22 (9.53)
35–44	436 (21.5)	341 (23.2)	51.66 (7.77)	54.11 (5.65)	49.10 (9.35)	49.88 (8.63)
45–54	433 (21.4)	314 (21.4)	49.82 (8.07)	50.78 (8.21)	47.48 (10.63)	49.29 (10.20)
55–64	508 (25.1)	319 (21.7)	46.55 (9.99)	48.51 (7.63)	49.37 (10.61)	51.52 (8.95)
*p**			<0.001	<0.001	0.014	0.004
Education						
Primary	171 (8.7)	86 (6.0)	44.24 (10.15)	48.53 (9.61)	46.44 (12.20)	48.66 (11.50)
Secondary	933 (47.3)	749 (52.5)	50.39 (8.64)	52.03 (8.12)	47.90 (10.73)	49.89 (9.51)
University	869 (44.0)	593 (41.5)	52.22 (7.17)	53.68 (6.26)	49.33 (9.17)	51.39 (8.36)
*p**			<0.001	<0.001	<0.001	0.002
City						
Athens	276 (13.6)	272 (18.5)	51.05 (7.54)	53.48 (7.26)	48.99 (9.71)	49.17 (8.62)
Budapest	356 (17.6)	248 (16.9)	50.72 (9.75)	53.68 (7.51)	50.09 (10.37)	51.97 (8.94)
London	298 (14.7)	273 (18.6)	51.72 (8.19)	50.86 (9.36)	46.72 (10.14)	49.27 (9.50)
Östersund	370 (18.3)	222 (15.1)	50.97 (9.20)	52.45 (7.29)	49.32 (9.88)	52.18 (8.99)
Porto	408 (20.1)	227 (15.4)	48.20 (7.69)	51.35 (6.12)	46.27 (11.39)	49.59 (10.32)
Stuttgart	318 (15.7)	228 (15.5)	51.93 (8.48)	53.08 (7.16)	49.31 (8.72)	50.81 (8.54)
*p**			<0.001	<0.001	<0.001	<0.001
Total			50.64 (8.48)	52.48 (7.63)	48.41 (10.23)	50.44 (9.23)
p†			<0.001		<0.001	

SD standard deviation

* *p* value ANOVA comparing mean scores of the SF-36 component summaries

† *p* value for *T* test comparing mean scores of the SF-36 component summaries in women versus men

eight, 15, and 25, as suggested by the original scale' author [31]. The mean number (standard deviation) of violent acts was computed according to violence involvement and severity subscales. *T* test was used to compare the mean number of minor and severe acts by sex. Correlations between the number of acts and the physical and mental component summaries of the SF-36 were also estimated separately for minor and severe acts of violence among participants reporting victimization, perpetration, and bidirectional involvement. The analyses were conducted using SPSS v20.

Results

In general, mean SF-36 physical and mental component summaries were higher in men than women (Table 1) and increased with the educational level in both sexes. The physical component summary mean score also significantly decreased with age in both sexes.

Statistically significant differences were found according to city of residence: The lowest mean scores for the physical component summary were observed in Porto for women (48.20 [7.69]) and in London for men (50.86 [9.36]), while the highest were observed in Stuttgart for women (51.93 [8.48]) and in Budapest for men (53.68 [7.51]); for the mental component summary, the lowest mean was observed in Porto for women (46.27 [11.39]) and in Athens for men (49.17 [8.62]), while the highest were observed in Budapest for women (50.09 [10.37]) and in Östersund for men (52.18 [8.99]).

As shown in Table 2, the past-year prevalence of victimization-only, perpetration-only and bidirectional physical assault in women was 3.5, 4.2 and 10.0 %, respectively, while the corresponding figures for men were 4.1, 3.8 and 11.9 %, with no sex differences. For sexual coercion, 7.7 % of women and 3.0 % of men declared to be only victims, 1.6 % of women and 7.5 % of men declared only perpetration, and 9.7 % of women and 12.5 % of men declared bidirectional involvement ($p < 0.05$). The observed frequency of concomitant involvement in physical assault and sexual coercion was 1.2 % in women and 0.5 % in men for victimization only, 0.2 % in women and 0.8 % in men for perpetration only, and 4.0 % in women and 5.1 % in men for bidirectional involvement ($p < 0.05$).

After adjustment for age, education, and city of residence, women involved in bidirectional physical assault presented a significantly lower physical component

Table 2 Adjusted mean scores for the SF-36 physical and mental component summaries, in women and men according to directionality of involvement in past-year physical assault and sexual coercion as types of intimate partner violence

	Women	Men	Physical health		Mental health	
	n (%)	*n* (%)	Women Adjusted mean (SE)[a]	Men Adjusted mean (SE)[a]	Women Adjusted mean (SE)[a]	Men Adjusted mean (SE)[a]
Physical assault						
No	1,592 (82.4)	1,108 (80.2)	49.75 (0.26)	51.96 (0.30)	49.09 (0.34)	50.25 (0.40)
Victim	67 (3.5)	56 (4.1)	49.09 (0.99)	52.15 (0.96)	42.05 (1.26)*	49.31 (1.27)
Bidirectional	193 (10.0)	165 (11.9)	48.00 (0.58)*	50.48 (0.59)	42.86 (0.73)*	46.34 (0.78)*
Perpetrator	81 (4.2)	52 (3.8)	48.76 (0.88)	51.96 (0.98)	45.46 (1.11)*	50.07 (1.30)
Sexual coercion‡						
No	1,566 (81.0)	1,063 (77.0)	49.64 (0.26)	51.71 (0.30)	48.26 (0.34)	50.04 (0.40)
Victim	149 (7.7)	41 (3.0)	49.27 (0.67)	53.81 (1.10)	44.74 (0.86)*	48.94 (1.47)
Bidirectional	187 (9.7)	173 (12.5)	48.01 (0.61)	51.70 (0.58)	46.85 (0.79)	48.14 (0.77)
Perpetrator	31 (1.6)	103 (7.5)	49.92 (1.44)	52.03 (0.71)	48.30 (1.87)	49.09 (0.95)
Physical assault and sexual coercion‡						
No	1,371 (94.6)	916 (93.6)	49.46 (0.29)	51.41 (0.34)	49.11 (0.36)	50.62 (0.43)
Victim	18 (1.2)	5 (0.5)	49.86 (1.90)	53.89 (3.12)	41.43 (2.36)*	45.97 (3.95)
Bidirectional	58 (4.0)	50 (5.1)	47.21 (1.04)	49.31 (1.03)	43.34 (1.30)*	46.17 (1.30)*
Perpetrator	3 (0.2)	8 (0.8)	39.57 (4.49)	54.29 (2.47)	48.42 (5.59)	51.98 (3.12)

* $p < 0.05$ for comparison with the "no-violence" group (Bonferroni correction was used in pair-wise comparison)

‡ $p < 0.05$ for chi-square test comparing the prevalence of violence by sex

[a] Adjusted for age, education, and city of residence; *SE* standard error

summary mean score (48.00 [0.58]) than those declaring no physical assault (49.75 [0.26]). No other significant difference was observed regarding the physical component summary.

A statistically significant lower mean score in the mental component summary of the SF-36 was found in the group of women involved in physical assault as victims and also in the group involved in bidirectional physical assault and in the group reporting perpetration of physical assault, compared with women reporting no past-year physical assault. The scores were also significantly lower among women only victims of sexual coercion compared with those who did not report past-year sexual coercion. Women who were victims only and who were involved in bidirectional physical and sexual IPV also presented lower mental component summary mean scores than those reporting no violence. In men, significant lower mental component summary scores were observed among those involved in bidirectional physical assault, and in bidirectional concomitant physical assault and sexual coercion, compared with those not involved in IPV.

Table 3 shows the results for ever experiencing physical assault and sexual coercion. In women, 5.6 % reported having ever been victims or perpetrators of physical assault and 15.9 % reported ever being involved in bidirectional physical assault. In men, these proportions were 5.4 % victims, 5.4 % perpetrators, and 18.4 % for bidirectional involvement. Lifetime victimization-only of sexual coercion was declared by 11.3 % of women and 3.5 % of men, bidirectional sexual coercion was 13.9 % in women and 18.9 % in men, and the prevalence of having ever perpetrated sexual coercion was 1.7 % in women and 8.9 % in men ($p < 0.05$). Victims-only of both physical assault and sexual coercion were 2.8 % in women and 0.8 % in men, perpetrators-only were 0.2 % in women and 1.7 % in men, and bidirectional involvement was 7.5 % in women and 11.4 % in men ($p < 0.05$).

In the models adjusted for age, education, and city of residence, we observed a lower mean score in the physical component summary of the SF-36 among women involved in violence bidirectionally. The difference was statistically significant when compared to women who declared no lifetime experience of the two types of violence considered. For the mental component summary, mean scores were lower for those involved in violence compared with those who never experienced it. Statistically significant differences when compared to those never involved in IPV were observed for women involved in physical assault (victims, perpetrators, and bidirectionally), women victims-only of sexual coercion, women victims and involved in bidirectional concomitant physical assault and sexual coercion, and for men involved in bidirectional physical

Table 3 Adjusted mean scores for the SF-36 physical and mental component summaries, in women and men according to directionality of involvement in lifetime physical assault and sexual coercion as types of intimate partner violence

	Women	Men	Physical health		Mental health	
	n (%)	*n* (%)	Women Adjusted mean (SE)[a]	Men Adjusted mean (SE)[a]	Women Adjusted mean (SE)[a]	Men Adjusted mean (SE)[a]
Lifetime physical assault						
No	1,407 (72.8)	978 (70.8)	49.83 (0.28)	51.99 (0.31)	49.54 (0.35)	50.62 (0.41)
Victim	109 (5.6)	75 (5.4)	49.79 (0.77)	52.47 (0.84)	44.82 (0.98)*	49.85 (1.11)
Bidirectional	308 (15.9)	254 (18.4)	48.03 (0.47)*	51.14 (0.49)	43.05 (0.59)*	46.56 (0.65)*
Perpetrator	109 (5.6)	74 (5.4)	49.30 (0.76)	50.91 (0.83)	46.92 (0.96)*	48.65 (1.09)
Lifetime sexual coercion‡						
No	1,415 (73.2)	948 (68.7)	49.74 (0.27)	51.83 (0.31)	48.49 (0.35)	50.40 (0.42)
Victim	218 (11.3)	48 (3.5)	49.54 (0.56)	53.59 (1.03)	45.03 (0.73)*	48.71 (1.37)
Bidirectional	268 (13.9)	261 (18.9)	48.01 (0.51)*	51.20 (0.50)	46.65 (0.66)	47.84 (0.66)*
Perpetrator	32 (1.7)	123 (8.9)	49.45 (1.41)	51.92 (0.65)	48.26 (1.83)	48.77 (0.86)
Lifetime physical assault and sexual coercion‡						
No	1,137 (89.5)	752 (86.0)	49.70 (0.32)	51.60 (0.37)	49.73 (0.40)	50.90 (0.46)
Victim	36 (2.8)	7 (0.8)	50.51 (1.32)	53.18 (2.80)	44.69 (1.66)*	46.12 (3.51)
Bidirectional	95 (7.5)	100 (11.4)	46.71 (0.82)*	50.05 (0.76)	43.06 (1.03)*	46.35 (0.96)*
Perpetrator	3 (0.2)	15 (1.7)	39.71 (4.46)	50.53 (1.78)	48.20 (5.59)	48.79 (2.24)

* $p < 0.05$ for comparison with the "no-violence" group (Bonferroni correction was used in pair-wise comparison)

‡ $p < 0.05$ for chi-square test comparing the prevalence of violence by sex

[a] Adjusted for age, education, and city of residence; *SE* standard error

assault, bidirectional sexual coercion, and accumulating the latter two experiences.

Discussion

We found that HRQoL is associated with physical and sexual abuse and that it varied with sex and role in the victim/perpetrator process, being especially evident for the mental component summary of the SF-36. In models adjusted for age, education, and residence, women victims-only of lifetime or past-year physical assault and sexual coercion presented lower scores in the mental component summary of the SF-36 compared with women not experiencing violence, which was not observed among men victims-only. Declared past-year and lifetime victimization and perpetration of physical assault and of physical assault and sexual coercion cumulatively were associated with a decreased mental component summary in both men and women. Female perpetrators-only of physical assault presented a lower mental component summary, compared with those not involved in any type of violence for both lifetime and past-year periods.

The results found in the present study and concerning victims are in line with the findings in a Norwegian sample of battered women, assessed in shelters, which showed a marked decrease in the mental health domains of the SF-36 [11]. Similarly, results from two Danish nationally representative, cross-sectional health interview surveys, revealed that victims of physical violence scored lower in HRQoL, and the effect was more pronounced in women than in men [10]. In our study, the accumulation of physical assault and sexual coercion in women victims represented a decrease in the mental component summary, as in a previous Australian study of the general population of women, for whom cumulative types of gender-based violence represented impaired quality of life [8]. Women victims of IPV present increased levels of depressive symptoms [32] and somatic complaints [33], have lower social support [34], all of which directly affect their health perception. Furthermore, physical assaults may directly increase the risk of injuries or predispose and aggravate some chronic diseases [35]. Although the severity of abuse impacts directly the physical health perception of a victim, the psychological stress associated with less severe types of IPV may also affect other acute or chronic health conditions through more indirect paths [36]. Etiologic studies are only in their beginnings, but the emotional suffering derived from any type of abuse is likely to affect the immune system as it responds to prolonged stress [37].

We also observed lower scores in the mental component summary of the SF-36 for men and women involved in bidirectional physical assault and in bidirectional concomitant physical assault and sexual coercion. This is in line with studies documenting that bidirectional violence might entail more severe acts [12, 38] and is associated with depressive symptoms [39], thus affecting the health perception of both men and women, particularly the domains linked to their mental health.

A significantly lower score in the physical component summary was only present in women involved in bidirectional violence during the previous year and lifetime compared with those not involved in IPV, which supports previous accounts of more deleterious health effects of IPV in women than in men [10] as a result of the physical conflict, and that considering the lifetime period helps elucidate sex differences present in factors associated with IPV experiences [40]. It has been suggested that women suffer more intimate partner violence victimization than men during their lifetime [40] and report more severe acts [41, 42]. An analysis of the chronicity of minor and severe acts of IPV in our sample (Supplementary Table 1) showed that women involved in past-year IPV reported more minor bidirectional physical assault acts and suffered more minor sexual coercion acts compared with men. No statistically significant sex difference was observed for the mean number of severe abusive acts, and the chronicity of IPV presents, essentially, negative correlations with the physical and mental component summaries of the SF-36.

In women, perpetration only of physical assault was also represented by a lower score in the mental component summary. Although the debate over the motivations of women's perpetration is still unresolved [43], previous studies linking depression with IPV perpetration in women suggest that feelings of guilt, shame, or regret might explain why women who perpetrate feel more depressed than non-perpetrators [17]. It has been suggested that depressive symptoms experienced by women who perpetrate are the result of a reaction to an event perceived as unusual to them, since their usual role is one of nurturing [44]. Thus, the same mechanism might explain the results found for the mental component summary of the SF-36, which includes domains linked to the individual's social functioning and emotional well-being, important characteristics of a depressive state.

Less is known about the impact of sexual coercion acts in HRQoL. It must be acknowledged that various types of violence generally coexist in the same violent intimate relationship [4, 45, 46], which increases the difficulty of disentangling the particular impact of each type of violence in HRQoL domains, should they prove to affect these domains differently. In women victims of past-year sexual coercion, we found a significantly lower score in the mental component summary, which is in line with a previous Italian study documenting the impact of sexual IPV victimization to be greater for female student victims (compared with male), with higher odds for panic attacks, alcohol use, eating problems, and suicide ideation [47]. It has been suggested that sexual coercion against men is qualitatively different, less severe, and that men are more likely to accept force in their sexual relationships, while women find it unacceptable more often [48].

The fact that no significant difference in the physical and mental component summaries of men was found for past-year IPV may also be due to a social desirability bias, with men tending to demonstrate a tougher posture [47]. A 1988 study performed in college students already reported that among 22 men victims of sexual coercion, 25 % felt "good" about being forced to have sex, 50 % felt "neutral," and 25 % felt "bad," whereas none of the 32 women victims assessed felt "good" and 88 % felt "bad or very bad" after a sex incident [49]. Men victims of sexual coercion may perceive their situation as positive, thus not feeling harmed or violated, but rather see it as an opportunity for sexual intimacy, which would result in better health perceptions. Nevertheless, the effects of male sexual coercion victimization should be the focus of further explorations [50].

The main strengths of this study include the large sample size, the geographical diversity, and the measurement of both the exposure and outcome with two reliable and commonly used instruments: the CTS2 [28] and the SF-36 [2, 20]. However, the cross-sectional nature of our study does not allow inferences on causality. As in all studies assessing sensitive topics, the potential bias imposed by social desirability is a limitation [51]. Our samples were drawn from the general population of adults living in urban centers, but we used different sampling procedures, which might have led to selection bias. However, the age distribution of the study samples was close to the resident population in Athens, London, and Stuttgart, but in Budapest, Östersund, and Porto, participants were older, and the educational level in all cities was generally higher than the resident population, which might translate into underestimation of violence [18]. It was not possible to collect information on non-responses in all cities. However, registry-based sampling (municipal or electoral) and random route are expected to provide acceptable coverage of the target population [18]. The past experience of the research consortium determined the choice for the particular cities assessed based on the region where institutions were established. The sites included in this study are representing cultural and social features that were not considered in the analysis. These European urban centers are different regarding IPV campaigns, gender equality initiatives, laws, action plans, and support mechanisms, all

expected to influence prevalence rates and attitudes toward disclosure. Some of the differences might still reflect the effect of unmeasured social and cultural characteristics of the different sampling locations.

Although IPV experience was disclosed using self-administered questionnaires, it is plausible to think that victims of severe violence might reject participation or answer in a more socially acceptable way, especially regarding males from more "patriarchal" societies [52]. Also, using individual data (compared with couple) to assess IPV may lead to underreporting, both in men and women, but even more in men for IPV perpetration [53, 54], although support for underreporting was not found in posterior results obtained in representative sample of USA adolescents [12]. However, the assessment of couples may increase the risk of violence, thus relying in individual data is a safer option.

For clarity and because they are the most commonly measured types of violence, we only analyzed physical assault and sexual coercion reports. Further analysis should also consider the other violence types (e.g., psychological, injury).

In summary, the results of this study provide empirical evidence for an association between IPV and the HRQoL and that the influence of violence in HRQoL depends on the type of involvement in violence. Lower scores were consistently observed in the mental component summary of the SF-36 in female victims of physical assault or sexual coercion. However, women and men reporting bidirectional violence also presented lower scores in the mental component summary of the SF-36, which calls for a particular focus on the bidirectional nature of IPV when intervention strategies are designed.

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Ethical standard The manuscript does not contain clinical studies or patient data.

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Supplementary Table. Mean number of intimate partner violence acts. Minor or severe physical assault and sexual coercion during the past year and correlation with the physical and mental component summaries of the SF-36 in men and women.

					Correlation coefficients			
			Women	Men	Physical Health		Mental Health	
			mean (SD)	mean (SD)	Women	Men	Women	Men
Physical Assault	**Victim**	Minor	5.45 (10.26)	4.46 (11.81)	-0.005	-0.069	-0.334**	-0.037
		Severe	2.28 (4.54)	2.95 (7.16)	0.013	0.133	-0.018	0.021
	Bidirectional	Minor†	21.72 (31.60)	14.92 (23.05)	-0.122	-0.082	-0.233**	-0.118
		Severe	13.42 (29.46)	11.62 (29.37)	-0.105	-0.093	-0.238**	-0.145
	Perpetrator	Minor	3.07 (6.35)	5.10 (15.40)	0.147	-0.204	-0.065	-0.476**
		Severe	0.79 (3.07)	2.37 (10.46)	-0.071	-0.172	-0.075	0.286*
Sexual Coercion	**Victim**	Minor†	7.30 (10.26)	4.27 (7.29)	-0.122	-0.384*	-0.223**	-0.256
		Severe	2.62 (10.48)	6.12 (13.78)	-0.021	0.379*	-0.055	0.126
	Bidirectional	Minor	33.24 (23.28)	30.84 (22.68)	-0.063	-0.036	-0.022	-0.052
		Severe	2.75 (10.12)	3.21 (13.83)	-0.135	-0.061	-0.092	-0.133
	Perpetrator	Minor	6.65 (8.21)	6.43 (21.67)	-0.104	-0.072	-0.195	-0.033
		Severe	0.87 (4.50)	0.42 (1.38)	0.169	-0.059	-0.013	-0.003

SD=standard deviation;
†p-value<0.05 for T-test comparing mean number of violent acts in women vs. men involved in intimate partner violence during the past year;
*correlation is significant at the 0.05 level (2-tailed);
**correlation is significant at the 0.001 level (2-tailed).

4.6. Factors associated with quality of services for marginalized groups with mental health problems in 14 European countries.

Diogo Costa*[1, 2], Aleksandra Matanov[3], Reamonn Canavan[4], Edina Gabor[5], Tim Greacen[6], Petra Vondráčková[7], Ulrike Kluge[8], Pablo Nicaise[9], Jacek Moskalewicz[10], José Manuel Díaz-Olalla[11], Christa Straßmayr[12], Martijn Kikkert[13], Joaquim J.F. Soares[14], Andrea Gaddini[15], Henrique Barros[1, 2], Stefan Priebe[3] (*BMC Health Serv Res. 2014; 3;14:49).*

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Factors associated with quality of services for marginalized groups with mental health problems in 14 European countries

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Abstract

Background: Different service characteristics are known to influence mental health care delivery. Much less is known about the impact of contextual factors, such as the socioeconomic circumstances, on the provision of care to socially marginalized groups.
The objectives of this work were to assess the organisational characteristics of services providing mental health care for marginalized groups in 14 European capital cities and to explore the associations between organisational quality, service features and country-level characteristics.

Methods: 617 services were assessed in two highly deprived areas in 14 European capital cities. A Quality Index of Service Organisation (QISO) was developed and applied across all sites. Service characteristics and country level socioeconomic indicators were tested and related with the Index using linear regressions and random intercept linear models.

Results: The mean (standard deviation) of the QISO score (minimum = 0; maximum = 15) varied from 8.63 (2.23) in Ireland to 12.40 (2.07) in Hungary. The number of different programmes provided was the only service characteristic significantly correlated with the QISO ($p < 0.05$). The national Gross Domestic Product (GDP) was inversely associated with the QISO. Nearly 15% of the variance of the QISO was attributed to country-level variables, with GDP explaining 12% of this variance.

Conclusions: Socioeconomic contextual factors, in particular the national GDP are likely to influence the organisational quality of services providing mental health care for marginalized groups. Such factors should be considered in international comparative studies. Their significance for different types of services should be explored in further research.

Keywords: Mental health services, Quality index of service organization, Socially marginalized groups, Multi-level analysis

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Background

Risk factors for poor mental health, including social marginalisation, are particularly common in large capital cities [1,2] and these environments deserve more focus in comparative studies on the provision of care for marginalized groups [3]. It has been suggested that comprehensive services addressing a range of different needs might be more efficient in delivering care to marginalized groups with high prevalence of mental disorders, such as the homeless, refugees and asylum seekers, Roma populations, sex workers and the long-term unemployed [4-9].

However, variation in the provision of health services, especially for vulnerable groups, can be attributed not only to the type of clients the units serve but also to the environment or broader context in which service is provided, as reflected in countries' socioeconomic characteristics [10,11].

The current paper aims to:

- describe an Index developed to measure services' organisation in the context of mental health care provided to socially marginalized people in Europe – the Quality Index of Service Organisation (QISO);
- test how the characteristics of services are associated with this created Index;
- test how country socioeconomic indicators impact on the Index when comparing European capitals.

Methods

Good practices in mental health care for socially marginalized groups in Europe were identified through the PROMO project - *Best Practice in Promoting Mental Health in Socially Marginalized People in Europe* [12]. PROMO was designed to assess programmes and systems of services in 14 European countries providing mental health care to socially marginalized groups. Services were assessed in terms of their organisational characteristics, type of clients, components of care and funding arrangements, and how these services interconnect to form systems [12].

The study focused on the following six social groups: the long-term unemployed, the homeless, street sex workers, asylum seekers and refugees, irregular migrants and travelling communities. Data collection was conducted within highly deprived areas of the capital cities of the following 14 European countries: Austria, Belgium, Czech Republic, France, Italy, Germany, Hungary, Ireland, Netherlands, Poland, Portugal, Spain, Sweden and United Kingdom.

A total of 28 highly deprived geographical areas, two in each participating capital city, were identified using local indices of public health and social deprivation. The population size of each area was intended to be between 80,000 and 150,000 inhabitants, with some flexibility to accommodate different local contexts. If chosen areas were too small, they were combined to achieve the target size. The selected areas were: Vienna: District 16 and District 20; Brussels: Schaerbeek & St Josse and Molenbeek; Prague: Prague 3 & 7 and Prague 8; Paris: Secteur Flandre in the 19th arrondissement of Paris and La Courneuve & Aubervilliers in Seine-Saint-Denis; Berlin: Wedding and Kreuzberg; Budapest: District 8 and District 7 & 9; Rome: District 7 and District 15; Dublin: Dublin North Central and Dublin West; Amsterdam: Bos en Lommer & De Baarsjes & Geuzenveld-Slotermeer and Amsterdam Zuid Oost; Warsaw: Praga Polnoc and Wola; Lisbon: Marvila & Santa Maria dos Oliváis and a group of smaller areas (Anjos, Castelo, Encarnação, Graça, Madalena, Mercês, Pena, Penha de França, Santa Catarina, Santa Engrácia, Santa Justa, Santiago, Santo Estêvão, Santos-o-Velho, São Cristóvão e São Lourenço, São José, São Miguel, São Nicolau, São Paulo, São Vicente de Fora, Sé, Socorro); Madrid: Villaverde and Centro; Stockholm: Rinkeby-Kysta & Spånga-Tensta & Skarpnäk and Sodermalm; London: Hackney and Tower Hamlets [13].

The aim was to assess all mental health, social care and general health services that potentially serve marginalized groups with mental health problems. Their organisational characteristics and components, including the type of provider, funding, accessibility, routine data collection, characteristics of staff and programmes provided to people with mental disorders from the marginalized groups were assessed using the *PROMO Tool for Assessment of Services* (available online) [14]. This structured questionnaire was developed through a Delphi process involving experts from the 14 countries. An online platform was developed to facilitate exchange of information amongst participants involved in this process. The final version of the instrument was translated into the languages of participating countries and three pilot interviews were conducted in each capital to assess applicability and suitability.

Data collection was focused on the two identified deprived areas, however, services located outside these areas were also assessed if they were used by clients from the target areas. Available directories and lists were used to identify relevant services, as well as information from local clinicians and experts. Service managers or a member of the staff with relevant knowledge were then contacted via email, telephone or post, and invited to participate after a detailed explanation of the purpose of the study and its implications. They were assessed through face to face or telephone interviews.

Ethical approval was not required for this study, as no patient data were collected.

The services were classified on the basis of their primary focus of care (mental health, general health or social care services) and with regard to the population

groups they were serving (either specific to one or more of the PROMO groups or generic, i.e. not focussing on a particular population group). Out of 617 services assessed, 350 were generic services (221 mental health care, 84 social care and 45 general health) and 267 were group-specific services (51 mental health care, 187 social care and 29 general health), (Table 1). Despite the existence of a common protocol for conducting assessments with managers or relevant staff, including numerous reminders for gathering information, some missing information still persisted for variables from all capital cities.

The Quality Index of Service Organisation score (QISO)

The QISO was developed to facilitate identification of organisational good practice in the context of providing mental health care for socially marginalized people. Its components were defined by the multidisciplinary team of experts involved in the PROMO consortium. The experts' professional backgrounds were in mental health and social care, public health and social sciences, encompassing both clinical and research expertise. The team of experts discussed and refined each potential quality indicator and its contribution to the overall index score until a consensus was reached on a final set. Evidence generated within the scope of this and other projects in which participating experts were involved was taken into account when developing the QISO [15,16]. This, in turn, resulted in different weightings of each component as a reflection of their importance to the provision of care to marginalised groups. An emphasis was put on self-referrals as the overall service accessibility and networking were highlighted in other PROMO data and in the findings of previous studies on the provision of care in the context of marginalisation. Clinicians working in deprived areas struggle to find adequate services to provide relevant care to the individuals from marginalised groups, with service coordination often being insufficient [13,15]. Amongst the four components of good practice identified in 154 interviews with experts from the 14 capital cities, three directly relate to access and referrals, specifically, facilitating access to services that provide different aspects of health care (reducing the need for further referrals), strengthening the collaboration and co-ordination between different services, and disseminating information on services both to marginalised groups and to practitioners in the area [13].

Therefore, information concerning service organisation comprised indicators covering six domains, with final organisation scores ranging from 0 to a possible maximum score of 15. Quality provision domains and their contribution to the overall score were: accessibility (8), supervision (1), multidisciplinary team (1), programmes provided (2), coordination (1) and evaluation (2).

Quality indicators within each domain correspond to specific service characteristics and account for up to two

Table 1 Typology of services assessed

	Target population		Primary focus of care		
	Generic	Group-specific	Mental health	Social care	General health
Austria	18 (5.1)	28 (10.5)	9 (3.3)	32 (11.8)	5 (6.8)
France	41 (11.7)	21 (7.9)	31 (11.4)	11 (4.1)	20 (27.0)
Hungary	4 (1.1)	1 (0.4)	1 (0.4)	1 (0.4)	3 (4.1)
Poland	26 (7.4)	16 (6.0)	17 (6.3)	19 (7.0)	6 (8.1)
Czech Republic	11 (3.1)	8 (3.0)	6 (2.2)	12 (4.4)	1 (1.4)
Germany	79 (22.6)	50 (18.7)	53 (19.5)	66 (24.4)	10 (13.5)
Italy	15 (4.3)	19 (7.1)	14 (5.1)	12 (4.4)	8 (10.8)
Netherlands	24 (6.9)	13 (4.9)	23 (8.5)	14 (5.2)	0
Sweden	0	5 (1.9)	2 (0.7)	0	3 (4.1)
Belgium	34 (9.7)	20 (7.5)	21 (7.7)	24 (8.9)	9 (12.2)
UK	38 (10.9)	28 (10.5)	40 (14.7)	21 (7.7)	5 (6.8)
Spain	6 (1.7)	11 (4.1)	6 (2.2)	11 (4.1)	0
Portugal	17 (4.9)	4 (1.5)	13 (4.8)	7 (2.6)	1 (1.4)
Ireland	37 (10.6)	43 (16.1)	36 (13.2)	41 (15.1)	3 (4.1)
Total	350	267	272	271	74

Figures are n (%).
Services were classified as either generic or group-specific, based on their target users: if more than 50% of the people using a service were from one of the marginalised group, the service was classified as specific for that group.
Social care, mental health or general health service classification was based on service self-definition. In cases where it was not clear whether a service was mental health specific or generic, if 50% of clients were estimated to have a mental health problem the service was classified as a mental health service.

points of the score as detailed in Table 2. *Accessibility* includes indicators on service opening hours, the existence of exclusion criteria for clients, and accepting self-referrals. *Supervision* refers to the provision of internal or external staff supervision of any type. *Multidisciplinary team* is defined as having staff with both mental health and social care professional backgrounds. *Programmes provided* refers to active outreach programmes and/or home visits to clients as well as case-finding. *Coordination* refers to services having routine meetings with other services. Finally, *Evaluation* includes indicators on recording data on input and attendance, as well as data on client satisfaction.

Service-level variables

In addition to service characteristics, which correspond to the indicators of quality of service organisation, a number of other service features were recorded during the PROMO assessments. In the current analysis, the total number of staff (measured in whole time equivalents, with the number of hours per week defined by each respondent according to his/her national norm) and the number of care programmes provided were used as service-level covariates, due to their importance to the quality of health provision, as asserted in the relevant literature [17], including mental health care studies [18]. Programmes were defined as specific health care or social interventions that each service potentially provides to their clients. Each service was assessed using a specific list of programmes: active outreach, case-finding, home visits, counselling, individual psychotherapy, group psychotherapy, self-help groups, occupational therapy, medication, detoxification and acute withdrawal treatment, drug addiction treatment, alcohol addiction treatment, direct practical help in clients' homes, befriending, leisure activities support, mental health advocacy, social welfare support, housing/accommodation advice and support, legal advice and support, job coaching/finding, mental health promotion measures and any other programmes specified by the service being assessed.

Country-level variables

Three Eurostat country-level socioeconomic indicators were included and tested: the country Gross Domestic Product (GDP), the Material Deprivation rate and the Gini coefficient. The GDP is a commonly used measure for assessing a country's wealth or socioeconomic status, while the Gini coefficient is a measure of income inequality which has been correlated with the prevalence of poor health outcomes and mental disorders [19]. The Material deprivation rate was also chosen because of its direct relevance to the marginalized groups studied, and is considered as an ecological measure of country's burden of social marginalization [20-22].

The Gross Domestic Product per capita in Purchasing Power Standards (PPS) (2008) has been defined by Eurostat as the value of all goods and services produced

Table 2 Quality Index of Service Organisation–domains, constituting indicators, definition of indicators and their value to the overall score

Domain	Indicator	Definition	Value
Accessibility	Days open	Open everyday Mon-Fri	1
	Opening hours: *a. Open outside normal office hours*	Open anytime outside normal office hours (Mon-Fri)	1
	Opening hours: *b. Open at weekend*	Open at weekend (anytime)	1
	Exclusion criteria: *a. Lack of motivation*	No to 'lack of motivation'	1
	Exclusion criteria: *b. Command of language*	No to "command of language of the host country"	1
	Exclusion criteria: *c. Addictions*	No to "addictions"	1
	Self-referrals	Yes to self-referrals	2
Staff supervision	Any supervision internal/external	Yes to any supervision (internal/external)	1
Multidisciplinary team	Presence of multidisciplinary team	Yes to any combination of mental health and social care professionals (at least one mental health and one social care professional)	1
Programmes provided	Active outreach/home visits	Yes to active outreach or home visits	1
	Case finding	Yes to case finding	1
Coordination	Routine meetings with other services	Yes to routine meetings	1
Evaluation	Recording data on input, attendance and satisfaction	Yes to recording data on input and attendance	1
		Yes to recording outcome data on satisfaction and experience	1

less the value of any goods or services used in their creation. The volume index of GDP per capita in Purchasing Power Standards is expressed in relation to the European Union (EU-27) average set to equal 100. A country index higher than 100 corresponds to GDP per capita higher than the EU average. Basic figures are expressed in PPS, a common currency that eliminates differences in price levels between countries, thus allowing meaningful volume comparisons of GDP between countries. This index is intended for cross-country rather than for temporal comparisons.

The Gini coefficient (2008) as a measure of income inequality is conceptualised as the relationship of cumulative shares of the population arranged according to the level of equalized disposable income, to the cumulative share of the equalized total disposable income received by them. The higher the Gini coefficient, the more inequality exists.

The Material Deprivation rate by poverty status (2008) is the percentage of the population with an enforced lack of at least three out of nine material deprivation items depicting material living conditions, such as housing conditions, possession of durables, and capacity to afford basic requirements [23]. The term 'enforced lack' refers to people wishing to possess items, but not being able to afford them and the items in question are part of a predefined 'economic strain and durables' dimension. 'Economic strain' refers to people not being able to afford to do things they would like to do, such as taking a week's annual holiday away from home, paying a mortgage, rent, utility bills or hire purchase instalments, having a meal with meat, chicken or fish every second day, keeping their home adequately warm, or being able to face unexpected expenses. The durables dimension corresponds to enforced lack of items such as a colour TV, a telephone, a personal car or a washing machine [24].

Statistical analysis

Quality index of service organisation distribution

Descriptive statistics were computed for the QISO distribution across countries. T-tests and ANOVAs were computed to compare and relate types of services with the QISO. An exploratory factor analysis was also performed to test the QISO components and reliability and is presented in Additional file 1.

Exploring factors associated with QISO

Correlations between the QISO and the service and country level variables were computed. Unifactorial and multifactorial linear regression analyses were used to examine the association between services characteristics and the QISO.

Exploring country differences in QISO

With the linear QISO score as an outcome, four models were built to account for the different levels of the variables: Model 0 (crude) analysed the capital-specific QISO variance without taking into account any other characteristics. Model 1 added the service variables (number of programmes provided and number of staff) in order to understand the role of individual service characteristics in explaining the differences between capital cities. In Model 2, country-level variables including the Gini coefficient and the Material Deprivation Rate were added to the service-level variables and, in Model 3, the GDP was added to models. Country-level effects on the QISO were measured by proportional change in variance from Model 0. Data from Hungary and Sweden were not included in the latter models, as they contributed with too few cases (5 and 2 services respectively).

Interclass Correlation Coefficients (ICC) were computed to show the percentage of observed variation in the QISO that was attributable to capital-level characteristics.

Logistic random effects models were also computed for each domain of the QISO score as outcomes, dichotomized at their median values. Since the outcome constitutes a newly created index, qualitative equal intervals cannot be assumed according to the score variation, requiring this sensitivity analysis. Results of these models are presented in Additional file 1, showing the same change in the ICC from null to fully adjusted models.

Finally, a stratified analysis was performed according to service typology to test differences in terms of the "clients served". Services were categorised as being either group specific or generic, as well as according to whether they provided mental health care, social care and/or general health care. A p-value of <0.05 was considered significant, and only statistically significant service-level variables found in models without stratification were included, together with the country-level variable that meaningfully decreased the ICC.

Analyses were performed using SPSS v.18 (SPSS Inc., Chicago, IL, USA), R v.3.0.0 and Mplus, v. 5.2.

Results

In the 14 European capitals, 811 services were identified and 617 assessed. In six capitals, less than 70% of services identified were assessed (Prague: 19 services assessed out of 38 identified; Budapest: 5 out of 12; Rome: 34 out of 80; Stockholm: 5 out of 11; Madrid: 17 out of 40 and Lisbon: 21 out of 55).

Quality Index of Service Organisation (QISO) description

The overall QISO was normally distributed, with a mean (SD) of 10.03 (2.13) (Figure 1).

This exploratory factor analysis revealed a 5-factor model as the solution with best fit, generically supporting the theoretical domains for the quality indicators proposed [see Additional file 1].

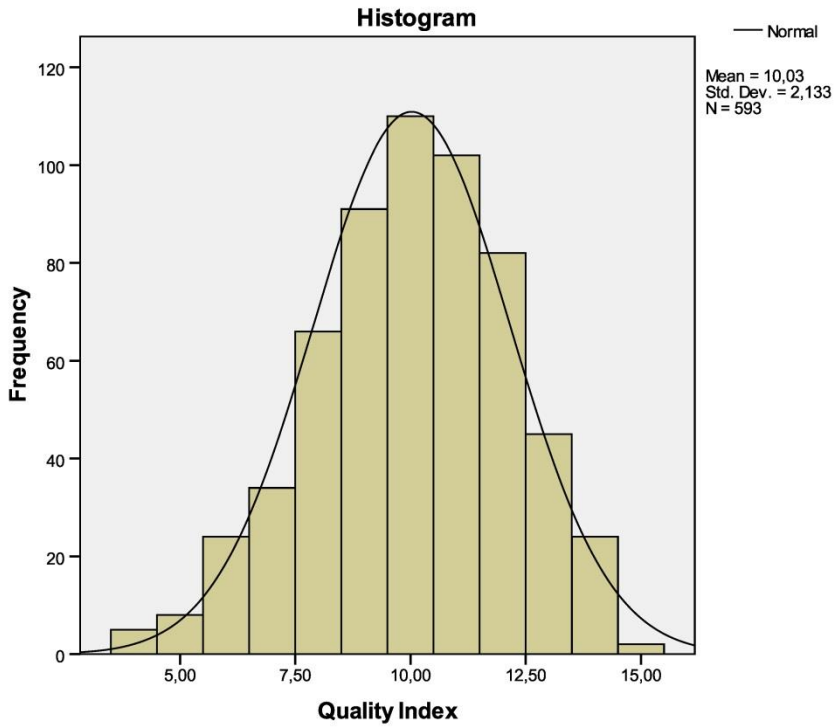

Figure 1 Histogram of Quality Index of Service Organisation score.

The mean (SD) number of staff per service across all participating countries was 33.69 (124.28), (Table 3). Services in Hungary had the highest mean (SD) number of staff, 499.20 (885.51), although with very few services contributing to that value. The country with the lowest mean (SD) number of programmes provided per service was Austria with 5.85 (3.00); Poland had the highest with 10.43 (3.84) programmes per service.

According to Eurostat for the year 2008, national GDP ranged from 134 for the Netherlands to 56 for Poland. The Gini coefficient varied between 35.8 in Portugal and 24.0 in Sweden. The Material deprivation rate was highest in Hungary (37.1) and Poland (32.3) and lowest in Sweden (4.6) and the Netherlands (5.2).

Factors associated with QISO

As shown in Table 4, both the number of staff per service, the number of programmes provided per service and the Gini coefficient correlated positively with the QISO across all countries while the GDP correlated negatively. There were no significant differences for mean QISO between generic and specific services: $t(591) = -0.77$, $p = 0.44$; nor between mental health care, social care and general health care services: $F(2,590) = 1.32$, $p = 0.27$, nor when considering all six types of services: $F(5, 587) = 0.83$, $p = 0.53$.

Results from the linear regression models indicated that the number of staff per service and the number of programmes provided per service are significantly associated with the QISO both in the unifactorial analysis and in the multifactorial analysis ($p < 0.05$).

Country differences in QISO

Figure 2 shows the relation of the total number of programmes with the QISO score, in the overall sample. As shown in Figure 3, the intercept and slope of the fitted regression line varies, indicating that the relationship between the QISO and the average number of programmes provided per service varies from one country to the next (Table 4).

As shown in Table 5, in the null random effects model, 14.8% of the variance was explained by country-level traits, as expressed by the Interclass Correlation Coefficient (ICC). The intercept in the empty model was equal to the overall average QISO score, which for this sample was 10.20; the variance component corresponding to the random intercept was 0.67.

When adding the service-level variables using Model 1 (total number of programmes, total number of staff), the percentage of variance in QISO attributable to country-level variables was 13.2%; in Model 2, the addition of the Gini coefficient and the Material deprivation rate did

Table 3 Quality Index of Service Organisation score (QISO) for each country, Number of staff (whole time equivalents), Total programmes provided, Gross Domestic Product (GDP), Gini coefficient and Material Deprivation rate

Country	QISO		Staff		Total programmes		Country GDP (Eurostat 2008)	Gini coefficient (Eurostat 2008)	Material deprivation rate (Eurostat 2008)
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)			
Austria	46	9.11 (1.93)	46	34.06 (77.77)	46	5.85 (3.00)	124	26.2	13.7
France	53	10.47 (1.86)	62	38.06 (122.44)	61	7.62 (4.86)	107	29.2	13.1
Hungary	5	12.40 (2.07)	5	499.20 (885.51)	5	9.20 (4.21)	64	25.2	37.1
Poland	38	10.82 (2.04)	39	41.78 (88.85)	42	10.43 (3.84)	56	32	32.3
Czech Republic	19	10.05 (2.27)	19	45.91 (155.13)	19	6.89 (3.71)	81	24.7	16.2
Germany	124	9.62 (2.03)	126	10.14 (17.85)	129	8.98 (3.87)	116	30.2	13
Italy	32	10.56 (1.63)	34	25.85 (48.93)	34	9.09 (4.00)	104	31	16.1
Netherlands	37	9.51 (1.95)	37	17.06 (17.40)	37	10.14 (3.71)	134	27.6	5.2
Sweden	2	13.00 (0)	5	10.80 (4.66)	5	9.40 (3.91)	122	24	4.6
Belgium	54	10.30 (1.78)	53	23.57 (57.73)	54	8.69 (4.44)	115	27.5	11.6
UK	66	11.14 (1.98)	65	20.95 (30.98)	66	9.73 (4.14)	115	33.9	11.3
Spain	17	11.35 (1.50)	17	55.76 (93.11)	17	7.06 (4.28)	103	31.3	8.7
Portugal	20	11.25 (1.52)	21	90.94 (150.36)	21	9.33 (3.38)	78	35.8	23
Ireland	80	8.63 (2.23)	80	11.27 (21.74)	80	7.90 (4.10)	133	29.9	13.6
Total	593	10.03 (2.13)	609	29.78 (109.93)	616	8.60 (4.16)			

not represent a marked difference in the ICC (12.3%); only in Model 3 with the addition of the GDP, did the ICC drop to 2.7%, i.e. the country GDP played a role in explaining differences in the QISO independently of the number of staff and programmes, the country Gini coefficient and the Material deprivation rate.

Considering only statistically significant service-level variables (total number of programmes) in the linear regression model, the same proportional decrease in the variance attributable to country-level variables was observed (results not shown).

As shown in Table 6, a decrease in the total variance observed in QISO scores across countries due to country-level variables was observable for all groups of services, although this was more evident for generic services, with a decrease of nearly 8% with the addition of GDP per capita: the ICC dropped from 21.6% to 13.8%. This percentage remained above 20% in the final model for mental health care services and reached 28.0% for general health care services. Only 1.1% of the variance remained attributable to country-level features for social care services from the initial 7.4% in the null model.

In summary, country GDP is important for explaining differences in QISO scores across all countries, independently of the number of programmes each service was providing. This remains true regardless of service typology, although the trend is more evident in generic services, i.e. services not specifically focussing on any particular marginalised groups.

Discussion

A good model fit was obtained for a five-factor model representing the QISO score across countries. The number of programmes provided per service was positively correlated with the QISO score. However, the change in the score related to the increase in the number of programmes varied across countries. Moreover, a decrease was observed in the percentage of QISO score variance attributable to country-level features, mainly with the addition of the GDP estimate. No significant differences were observed in QISO

Table 4 Correlations and linear regression between the Quality Index of Services Organisation score (QISO) and relevant service-level and country-level variables

	Total Staff	Total Programmes	Country GDP	Gini coefficient	Material Deprivation Rate
Spearman's rho	0.327*	0.350*	-0.329*	0.220*	-0.066
Standardized ß (crude model)	0.136*	0.352*			
Standardized ß (adjusted model)**	0.118*	0.348*			

*p < 0.05; Hungary and Sweden not included.
**adjusted model includes both number of staff and number of programmes.

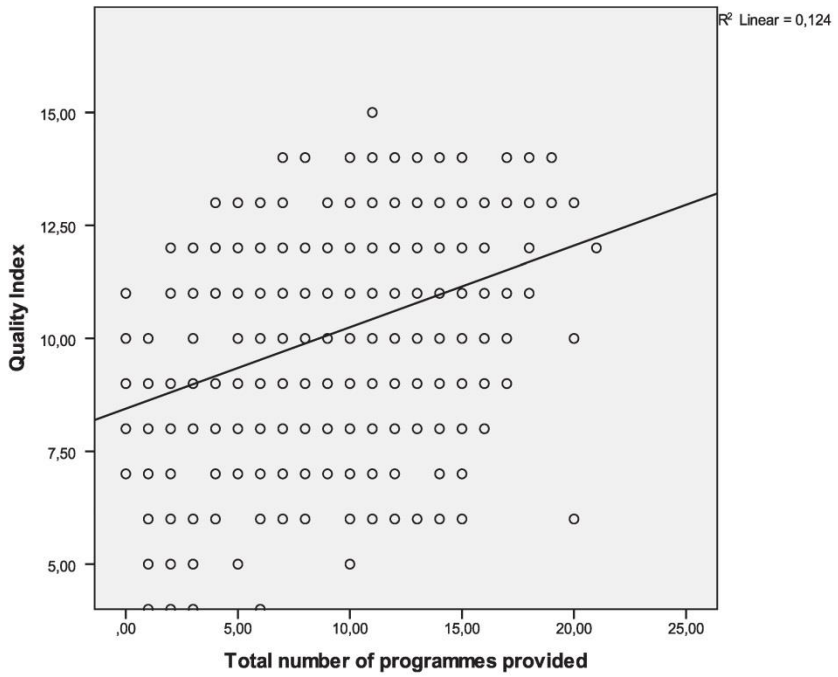

Figure 2 Overall fitted regression line of total number of programmes and QISO score.

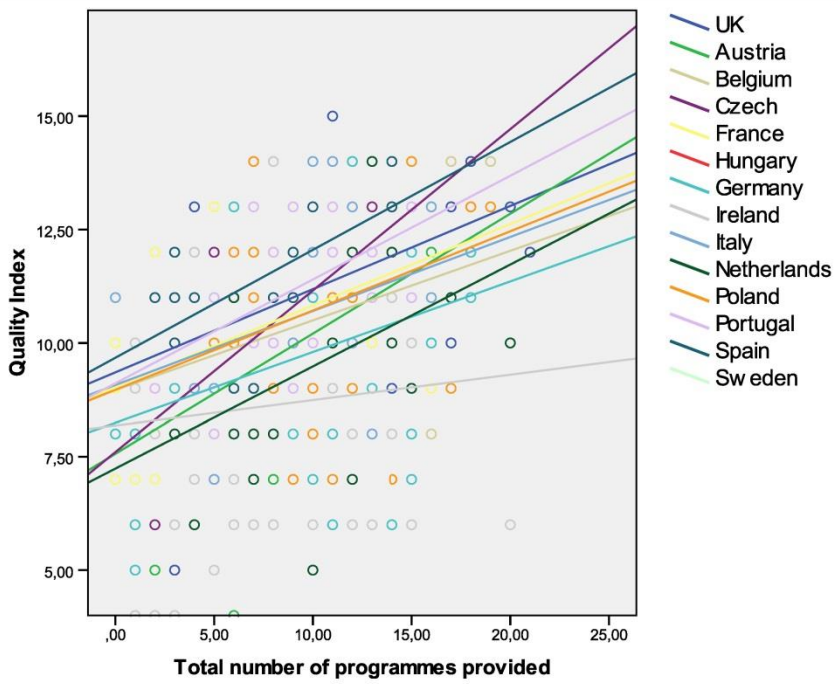

Figure 3 Fitted lines of total number of programmes provided and QISO score by country.

Table 5 Results from random intercept model for the Quality Index of Service Organisation score–measures of variation

		Model 0	Model 1	Model 2	Model 3
	Fixed				
	Intercept (SE)	10.20* (0.25)	8.69* (0.28)	5.00 (2.26)	12.69* (2.17)
Service level	Total programmes		0.17* (0.02)	0.16* (0.02)	0.16*(0.02)
	Total number of staff		2.10E-3 (1.19E-3)	2.05E-3 (1.09E-3)	1.98E-3 (1.08E-3)
Country level	Gini			0.12 (0.08)	0.12 (0.05)
	Material Deprivation rate			-1.88E-3 (0.04)	-0.14 (0.04)
	GDP				-0.05 (0.01)
	Random				
	Intercept (SE)	0.67 (0.33)	0.52 (0.26)	0.48 (0.27)	0.10 (0.08)
	Residuals (SE)	3.86* (0.23)	3.42* (0.20)	3.42* (0.20)	3.41* (0.20)
	ICC (%)	14.8	13.2	12.3	2.7

*p < 0.001 (Wald Z statistic for random effects); SE = Standard Error; ICC = Interclass correlation coefficient.
Model 0 = null model, baseline model without any exposure variable.
Model 1 = adjusted for total number of programmes provided by services and number of staff.
Model 2 = additionally adjusted for Gini coefficient (2008) and Material deprivation rate (2008).
Model 2 = additionally adjusted for Gini coefficient (2008), Material deprivation rate (2008) and country-level GDP (2008).

Table 6 Results from random intercept model for the Quality Index of Service Organisation score–measures of variation, stratified by service target as Group Specific and Generic and by type of care as Mental Health Care, Social Care and General Health Care

		Service target		Service care		
		Group specific	**Generic**	**Mental health**	**Social care**	**General health**
Model 0	**Fixed**					
	Intercept (SE)	10.06* (0.23)	10.26* (0.32)	10.32* (0.36)	10.03* (0.21)	10.13* (0.46)
	Random					
	Intercept (SE)	0.40 (0.25)	1.05 (0.53)	1.29 (0.63)	0.31 (0.2)	1.48 (1.18)
	Residuals (SE)	3.79* (0.34)	3.83* (0.30)	3.71* (0.33)	3.92* (0.35)	2.61* (0.52)
	ICC (%)	9.5	21.6	25.8	7.4	36.2
Model 1	**Fixed**					
	Intercept (SE)	8.74* (0.34)	8.75* (0.36)	8.58* (0.44)	8.49* (0.31)	9.06* (0.51)
	Total Programmes	0.17* (0.03)	0.16* (0.02)	0.17* (0.03)	0.21* (0.04)	0.17 (0.05)
	Random					
	Intercept (SE)	0.34 (0.22)	0.81 (0.42)	1.11 (0.55)	0.19 (0.16)	0.71 (0.74)
	Residuals (SE)	3.48* (0.32)	3.37* (0.27)	3.25* (0.29)	3.49* (0.31)	2.46* (0.50)
	ICC (%)	8.9	19.3	25.4	5.0	22.3
Model 2	**Fixed**					
	Intercept (SE)	10.68* (1.06)	11.27* (1.20)	11.37* (1.48)	10.46* (0.79)	8.97 (2.01)
	Total Programmes	0.16* (0.03)	0.16*(0.02)	0.17* (0.03)	0.20* (0.03)	0.16 (0.05)
	Country-GDP	-0.02 (0.01)	-0.02 (0.01)	-0.03 (0.01)	-0.02 (0.01)	1.03E-3 (0.02)
	Random					
	Intercept (SE)	0.23 (0.18)	0.54 (0.32)	0.83 (0.45)	0.04 (0.09)	0.95 (0.94)
	Residuals (SE)	3.48* (0.32)	3.37* (0.27)	3.25* (0.29)	3.49* (0.31)	2.44* (0.49)
	ICC (%)	6.3	13.8	20.3	1.1	28.0

*p < 0.001 (Wald Z statistic for random effects); SE = Standard Error; ICC = Interclass correlation coefficient.
Model 0 = null model, baseline model without any exposure variable.
Model 1 = adjusted for total number of programmes provided by services.
Model 2 = adjusted for total number of programmes provided by services and country-level GDP (2008).

scores when stratifying according to services' primary target clientele (generic vs. specific) or their primary focus of care (mental health care, social care or general health care).

The decrease in the attributable variance was more pronounced in generic services than in group-specific services and slightly higher in general health services compared to mental health and social care services. More specifically, national GDP matters when explaining QISO score differences between countries, and this remains true independent of the number of programmes that services may be providing. This phenomenon is more apparent in generic services than in group-specific services, and also more apparent in general health care services compared to services focusing on mental health care or social care.

The Quality Index of Service Organization was developed via Delphi process and in-depth discussions among the PROMO team members, representing a large variety of academic and clinical expertise. It reflects elements that were seen as conceptually important for assessing the quality of service organisation in the context of providing mental health care for socially marginalized groups. QISO components were chosen and weighted to match the evidence on health care provision arising from, but not restricted to, the group's own research [3,12,15,25-27]. The exploratory factor analysis performed (Annex I) confirmed the proposed structure of the QISO domains, although the loadings obtained for the Staff supervision, Multidisciplinary team and Coordination domains were weak, which was expected as they are meant to account individually as distinct constructs with only one item representing each domain.

Nevertheless, the results obtained in the current analysis were further tested with dichotomization of each component and the same changes were observed in hierarchical models, thus strengthening the validity of our measure.

Another strength of the study is the fact that participating services across 14 countries were assessed using a uniform measurement tool with researchers following standardised protocols for interviewing. This is a significant change from traditional approaches to quality of care assessment in the context of marginalisation where objective measures are lacking.

A limitation of this analysis resulted from the absence of reliable and comparable figures describing the size of marginalized groups and the prevalence of mental disorders in each city, which would have allowed testing these associations at a different level. Consequently, the observed associations may be due to other confounding factors that were not accounted for in this analysis [28].

As the number of potential clients is much higher in some countries than in others [29] and the spectrum of mental disorders differs between vulnerable groups [6,7], service development may have been oriented towards different performance targets aiming to provide pragmatic solutions to the daily needs of clients or to comply with vertical governmental policy decisions.

At the service level, the number of programmes was found to be associated with the QISO score, whereas this was not the case for the number of staff members. This suggests that the size of services, in terms of human resources, is less important to organisational quality than the range of approaches provided within each service, which in turn may translate into reduced needs for referrals and thus less expenditure.

In our analysis, the use of the number of programmes as both a constituting domain of the QISO score and as an independent variable in our models could represent some overlap. However, for the QISO domain, only three programmes (out of 22 possible), were considered to count as one point, and the results of the additional sensitivity analysis (Additional file 1) for the dichotomized domains, revealed the same trend in explained variance after addition of service and country level variables, thus favouring our conclusions.

Comparing health services across different countries poses a number of difficulties, including the variability of terminologies employed and arrangements implemented across all types of health services [30]. Our goal was to assess all services that potentially serve individuals from marginalised groups who experience mental health difficulties, and consequently an inclusive understanding of mental health care was applied to accommodate different health and social care systems. As a result, we assessed a variety of services, from large state-funded general hospitals to local and target-specific non-governmental institutions providing care to one of the marginalised groups of interest. Despite the comparison difficulties, we believe the perspective taken is useful for the description of mental health care provision across Europe and for future health policy planning in particular through raising awareness about the number, variety and overlap of different services involved in providing care to marginalised groups and the need for coordination [13].

As previous comparisons of health care provision have shown, contextual factors do matter in delivery of care [10,31]. In a review emphasizing the contribution of epidemiology to government policy, Jenkins [32] showed how representative information collected in a defined geographic area can indicate the actual use of existing services and be utilised to estimate the extent of unmet needs and service provisions required [32]. Research has consistently shown that various measures of social deprivation, positively correlate with psychiatric disorders [33], and that prevalence of these disorders is higher in countries with greater inequality [19].

Given that we assessed services in two highly deprived areas of each capital, homogenous within each city, but heterogeneous between capitals, various characteristics may have influenced the organisational quality of specific services, independently of their nature and the target groups they are serving. However, we observed that simple country-level socioeconomic factors, theoretically close to a broad "deprivation" indicator, seem to influence this relationship.

Probably, the most interesting finding from our work is that the measure of quality organisation in the provision of care is negatively associated with the country GDP. Although the Gini coefficient was not relevant for the country differences, it correlated positively with the QISO score, with which it shows congruency, since "poorer" countries tend to have more inequalities. Mental health care and social care services as well as services targeting specific marginalized groups seemed to be less influenced by this phenomenon compared to generic services and services providing general health care. This suggests that national socioeconomic factors may be more relevant to the quality of care provided by these latter types of services to socially marginalized groups, although the number of programmes provided should also be considered.

The reason why "richer" countries perform less well on the quality score remains unclear. A number of hypotheses could be advanced to explain this phenomenon such as the need of the countries' to invest in generic health services for this type of population; the fact that having a higher GDP results in relatively smaller numbers of marginalised individuals; or inherent different traditions and investment in social integration compared to services of "poorer" countries where more efforts are made to provide care to marginalized groups. Furthermore, services in countries with higher GDPs may be more efficiently organized, with specific services providing specific programmes, compared to more "disorganized" systems being forced to provide a variety of programmes despite insufficient resources. Finally, it could be argued that richer countries might be providing a greater variety of services, which may result in a more fragmented system as reflected in the QISO.

Conclusions

In summary, socioeconomic contextual factors, in particular the national GDP, are likely to influence the organisational quality of services providing mental health care for marginalized groups, and this is particularly the case for general health services such as hospitals and primary health care centres, where "poorer" countries perform, on average, slightly "better". Such factors should be taken into account in international comparative studies of service care provision and in political decision-making related to health care fragmentation and allocation of resources. Their significance for different types of services should also be explored in future research in order to bring further insight into organisational features that might benefit marginalised groups in terms of accessing mental health care. The created QISO score could also be useful beyond the six socially marginalised groups analysed in the scope of the PROMO project, enabling further insight into differences observed between typologies of services (e.g. generic, group-specific), all of which are important for mental health care but often not coordinated, overlapping in their interventions and struggling to overcome known barriers in accessibility.

Additional file

Additional file 1: Results from the exploratory factor analysis performed for the Quality Index of Service Organisation (QISO) and models fitted for QISO dichotomized domains.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

All authors were involved in the research design and data collection procedures. DC performed the statistical analysis for this manuscript and wrote the first draft of the paper. AM, HB and SP, provided further input to the conceptualisation and writing. RC, EG, TG, PV, UK, PN, JM, JMDO, CS, MK, JJFS and AG provided additional revisions to latest versions of the manuscript. All authors contributed to the work, read and agreed to the final manuscript.

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Additional File 1

Exploratory factor analysis for the *Quality Index of Service Organization*.

An exploratory factor analysis (EFA) was performed to test the underlying structure of the created index. The EFA was performed using the maximum likelihood estimation method together with the Geomin rotation. The fit of the QISO was tested using the Tucker-Lewis Index (TLI), the comparative fit index (CFI), the Route mean square error of approximation (RMSEA) and the Standardized root mean square residual (SRMR). The CFI and TFI indexes range from 0 to 1, with higher values indicating a better model fit, whereas to the RMSEA and SRMR, also ranging from 0 to 1, lower values indicate a better model fit. IF CFI and TFI are 0.90 or higher and RMSE and SRMR are close to 0, the model indicates good fit.

Table 1. Factor loadings obtained from the exploratory factor analysis for the Quality Index of Service Organization domains.

		Loadings of five-factor solution				
Domain	**Indicator**	**F1**	**F2**	**F3**	**F4**	**F5**
Accessibility	Days open	0.287	-0.107	-0.071	0.088	0.192
	Opening hours: *a. Open outside normal office hours*	**0.748**	0.063	0.018	0.026	0.045
	Opening hours: *b. Open at weekend*	**0.993**	0.000	-0.010	-0.027	-0.148
	Exclusion criteria: *a. Lack of motivation*	-0.005	**0.596**	0.043	0.080	0.006
	Exclusion criteria: *b. Command of language*	0.087	**0.899**	-0.152	-0.045	0.032
	Exclusion criteria: *c. Addictions*	-0.150	**0.588**	0.136	0.074	-0.190
	Self-referrals	0.010	-0.013	**0.959**	-0.002	0.008
Staff supervision	Any supervision internal/external	0.201	-0.206	0.031	0.370	0.249
Multidisciplinary team	Presence of multidisciplinary team	0.127	0.071	0.061	0.020	0.194
Programmes provided	Active outreach/home visits	-0.167	0.058	-0.084	**0.607**	0.008
	Case finding	-0.008	0.007	0.007	**0.843**	-0.066
Coordination	Routine meetings with other services	0.069	0.042	0.112	0.291	0.129
Evaluation	Recording data on input and attendance	-0.020	0.049	0.200	-0.090	**0.717**
	Recording outcome data on satisfaction and experience	-0.024	-0.054	-0.096	0.098	**0.687**

The Comparative fit index (CFI) was 0.984 and the Tucker-Lewis index TFI was 0.953. The Root mean square error of approximation (RMSEA) was 0.026 and the standardized root mean square residual (SRMR) was 0.040, thus indicating a good global fitness for the QISO.
This exploratory factor analysis supports a five-dimension solution (Table 1). The Staff supervision, Multidisciplinary team and Coordination domains revealed poor loading values amongst the factors. Within the Accessibility domain, the two "Opening hours" items loaded in the first factor and the three "Exclusion criteria" items loaded in the second factor, while the "Self-referrals" item loaded in the third factor. The two items from the Programs provided domain loaded in the fourth factor while the two items from the Evaluation domain loaded in the fifth factor.

Table 2. Median Odds Ratio (MOR) and Interclass Corelation Coeficients (ICC) from random intercept logistic models

		Model 0	Model 1	Model 2
QISO score	**MOR**	1.80	1.75	1.18
	ICC (%)	28.10	26.15	2.78
Accessibility	**MOR**	1.74	1.73	1.40
	ICC (%)	25.41	25.24	11.32
Staff Supervision	**MOR**	1.96	2.12	1.85
	ICC (%)	34.38	40.26	31.08
Multidisciplinary team	**MOR**	1.89	1.53	1.25
	ICC (%)	31.38	7.56	2.77
Programmes provided	**MOR**	1.94	2.01	1.71
	ICC (%)	33.16	36.43	25.12
Coordination	**MOR**	1.80	1.75	1.37
	ICC (%)	28.17	26.03	10.14
Evaluation	**MOR**	1.87	1.84	1.60
	ICC (%)	30.58	29.26	20.01

*Domains were dichotomized at their median values;
Model 0 = null model, baseline model without any exposure variable
Model 1= adjusted for total number of programmes provided by services and number of staff
Model 2= additionally adjusted for GINI coefficient (2008) and Material deprivation rate (2008)
Model 2 =additionally adjusted for GINI coefficient (2008), Material deprivation rate (2008) and country-level GDP (2008)

4.7. Forgoing healthcare and intimate partner violence: population-based, international, multicenter study.

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Abstract

Objectives: To examine the relation between forgone healthcare and involvement in intimate partner violence (IPV) as victims, perpetrators or both (reciprocal or bidirectional).

Methods: This cross-sectional multicentre study assessed community non-institutionalized residents (n=3496, aged 18-64) randomly selected from six European cities: Athens, Budapest, London, Östersund, Porto, and Stuttgart. A common questionnaire was used, including self-reports of IPV and forgone healthcare ("Have you been in need of a certain care service in the past year, but did not seek any help?"). Odds ratios (ORs), 95% confidence intervals (CIs) were computed fitting logistic regression models adjusted for city, chronic disease, self-assessed health status and financial strain.

Results: Participants experiencing past year IPV (vs. no violence) reported more often to forgone healthcare (n=3279 with valid answers, 18.6% vs.15.3%, p=0.016). Reciprocal IPV was associated with forgone healthcare (adjusted OR, 95%CI: 1.41, 1.09-1.81). A similar association was observed among victims, although statistically non-significant (1.35, 0.89-2.04).

Conclusion: IPV was associated with forgone healthcare, although dependent on the type of involvement as victims, perpetrators or both. Results suggest that preventing IPV among adults may improve timely healthcare uptake.

Introduction

Financial barriers and a disadvantaged socioeconomic position have been identified as relevant determinants of forgoing healthcare (1, 2). However, other adverse events or experiences might result in underutilization of needed health services and ultimately contribute to a poorer health. This might be the case of violence, in particular when occurring between partners in an intimate relation (3).

Most partners involved in violent acts sustain injuries that do not result in hospitalization or death, but might otherwise influence their health status (4). For different reasons, including feelings of shame (5) and fear of retaliation (6, 7), people involved in intimate partner violence (IPV) are likely to postpone healthcare or to omit the potential cause of their signs or symptoms (7-9).

In the World Health Organization (WHO) Study on Women's Health and Domestic Violence, that compared 48 population-based surveys, most IPV victims did not seek for help or care (10) but since healthcare utilization questions were only posed to victims (7, 11) it is not possible to estimate the impact of victimization in the help-seeking behaviour of people involved in acts of IPV.

Forgoing or delaying healthcare can worsen prognosis, increase the risk of hospitalisation and of longer hospital stays (2, 12), decrease treatment adherence and diminish the quality of life (13). It is a relatively common situation mainly constrained by financial barriers that frequently affect children and disabled people. Few studies considered the impact of IPV on forgone healthcare. Forgone mental healthcare was shown to be associated with female victimization (14) and with male perpetration of IPV (15) in the United States. In France, a population-based study conducted in an underprivileged area of Paris found a significant association between life-course experience of physical, sexual or psychological abuse and forgone healthcare (16). However, violence can influence the decision of forgoing healthcare and interact with other commonly described determinants of delaying care, widening the health impact of IPV.

The aim of the present work was thus to examine the relation between IPV and forgone healthcare according to three different partner violence groups: those experiencing IPV as victims; those experiencing IPV as perpetrators; and those experiencing IPV as both (reciprocal or bidirectional violence).

Methods

Study design and participants

The data presented in this study was collected as part of the DOVE project (http://doveproject.eu), a multicentre European project aiming to assess IPV frequency and

health-related outcomes. A detailed description of the study design, methods and enrolled participants was published elsewhere (17). In brief, the target population consisted of non-institutionalized adult men and women, aged 18-64, national citizens or documented migrants, living in eight cities: Ghent – Belgium, Stuttgart – Germany, Athens – Greece, Budapest – Hungary, Porto - Portugal, Granada – Spain, Östersund – Sweden and London – United Kingdom. Sites were selected based on previous research collaborations and expected to represent geographical and cultural diversity in Europe. To compare the prevalence of IPV across cities, a sample size of 544 participants was set for each centre, considering a 15% prevalence of IPV and a 3% relative precision. Samples were proportionally stratified by age and sex to represent the resident population, based on 2008 National Statistics Institutes. In Granada and Ghent, the aimed sample size was not achieved, thus we excluded participants from these sites in the current analysis.

Responding to local constraints, different sampling strategies were taken: in Stuttgart, random sample lists were obtained from the municipality registry; in Porto random lists were drawn from the electoral registry and random-digit-dialling of city landlines was performed; in London, random lists were obtained from electoral registry and a via-public approach in selected public spaces was conducted; in Östersund, the state person address registry was consulted; in Athens and Budapest, random route was used. Invitation letters with a concise description of the project were sent to participants selected based on registries and the study was presented by trained interviewers as part of the invitation procedure to participants contacted by telephone or at their houses. A common questionnaire was developed covering socio-demographic characteristics, intimate relationships, physical and mental health. Following ethical recommendations, the IPV section was self-administered in all centres and the remaining sections were preferably collected through face-to-face interviewing. However, in Östersund, all questionnaires were mailed to be self-completed and returned using a pre-paid envelope. This option was also considered in Stuttgart for the majority of evaluations (74.5%) and to a lesser extent in Porto (14.0%) and in London (3.5%). Signed informed consent was obtained from every participant that provided information by face-to-face interview. All centers followed the World Health Organization ethical and safety guidelines for the conduct of this type of research (18). A local Research Ethic Committee in each participating center approved the study protocol.

Intimate partner violence

The Revised Conflict Tactics Scales (CTS2) (19) was used to ascertain exposure to IPV. In this study three types of violence were considered: sexual coercion, physical assault and injury, but not separately analysed. Participants were asked about their involvement in

specific acts of violence and classified according to violence directionality as victims, perpetrators or involved in violence as both victims and perpetrators during the past year.

Social and demographic characteristics

Gender, age, marital status education and financial strain were self-reported. Age was categorized in five-year groups (18-24, 25-34, 35-44, 45-54 and 55-64), marital status was categorized in four groups (as single, cohabiting, married and divorced/separated/widowed) and education as primary (level 0-1), secondary (level 2-4) and university (level 5-8) based in the levels of the International Standard Classification of Education (ISCED) (20).

Financial strain was characterized using the question “How often are you worried about the daily expenses (e.g. buying food): Never; Often; Quite Often; Always?”. For analysis, participants were grouped in three categories: never, often (including quite often) and always.

Forgone healthcare and health related variables

Forgoing healthcare was ascertained according to the answer (yes/no) to the following question “Have you been in need of a certain care service in the past year, but did not seek any help?”.

Participants were presented a list of 12 chronic conditions, including asthma, chronic bronchitis, diabetes, digestive disorders, musculoskeletal diseases, cardiac pathology, severe depression or other mental illness, high blood pressure, stroke, migraine, epilepsy or fits. For analysis, we defined a ‘chronic disease status’, from the further dichotomized response as ‘yes’ (at least one positive answer) or ‘no’.

Self-assessed health status was characterized using the question “In general, would you say your health is: Excellent; Very good; Good; Fair; Poor?” as presented in the Medical Outcomes survey Short-Form 36 (21). For analysis, we grouped participants into three categories: excellent and very good, good, or fair and poor.

Participants were also asked about their usual type of healthcare services provider, and divided as public or private sector clients.

The number of visits to an emergency department or a primary healthcare center during the previous 12-month period was recorded. For the analysis, answers were dichotomized as none or at least one visit to each type of health service.

Statistical analysis

A four-level variable was coded to account for violence directionality, considering the presence of any act of violence regardless of the specific type (sexual coercion, physical

assault or injury): absence of violence; victim of at least one act of violence; perpetrator of at least one act of violence; victim and perpetrator of at least one act of violence.

From the 3496 sampled participants, we analysed the reports of 3279 that had complete information about IPV and forgone healthcare. Missing information in the remaining covariates ranged from 0.1% to 8.0%.

The Chi-square test was used to compare the prevalence of forgone healthcare and of involvement in IPV according to city of residence, sex, age, marital status, education, financial strain, self-assessed health, type of health services provider, chronic disease, past year emergency department and primary healthcare centre utilization.

Logistic regression models were fitted to measure the association between forgoing healthcare and different exposure variables. Models used observations with valid values for all variables included. Crude and adjusted odds ratios (OR) with respective 95% Confidence Intervals (95%CI) were calculated. Variables showing a significant bivariate association with forgone healthcare and with IPV were included as potential confounders in the multivariate model. Given the established evidenced linking financial barriers with forgone healthcare (22) and a disadvantaged socioeconomic position with IPV (10), financial strain was included in the final model.

Results

Overall, 16.3% of participants declared to have forgone healthcare during the previous year. Participants involved in IPV more significantly often reported forgone healthcare (18.6% vs. 15.3%, p=0.016).

As shown in Table 1, forgone healthcare was more frequent among participants residing in Stuttgart (22.3%), Östersund (17.7%) and Porto (17.4%). Participants with a lower educational level, more financial strain, a poorer self-assessed health, living with chronic diseases and who visited an emergency department or primary care during the previous year, were significantly more likely to report forgoing healthcare.

Table 1. Social and demographic characteristics, health-related outcomes and any intimate partner violence involvement, by forgone healthcare.

		Forgone Healthcare		
		Yes	**No**	
		n (%)	**n (%)**	**p***
City of residence	Athens	69 (12.8)	469 (87.2)	<0.001
	Budapest	75 (12.8)	511 (87.2)	
	London	80 (15.7)	431 (84.3)	
	Östersund	97 (17.7)	450 (82.3)	
	Porto	104 (17.4)	495 (82.6)	
	Stuttgart	111 (22.3)	387 (77.7)	
Sex	Male	213 (15.6)	1152 (84.4)	0.356
	Female	323 (16.9)	1591 (83.1)	
Age	18-24	55 (14.9)	313 (85.1)	0.632
	25-34	111 (16.4)	564 (83.6)	
	35-44	126 (16.7)	628 (83.1)	
	45-54	126 (17.9)	579 (81.6)	
	55-64	118 (15.2)	659 (84.3)	
Marital Status	Single	141 (16.6)	708 (83.4)	0.341
	Cohabiting	81 (15.7)	436 (84.3)	
	Married	229 (15.6)	1241 (84.4)	
	Divorced, separated, widowed	84 (19.1)	355 (80.9)	
Education	University	197 (14.3)	1182 (85.7)	0.012
	Secondary	273 (17.4)	1300 (82.6)	
	Primary	50 (20.7)	192 (79.3)	
Financial strain	Never	131 (12.6)	905 (87.4)	<0.001
	Often	286 (17.0)	1393 (83.0)	
	Always	118 (21.4)	433 (78.6)	
Chronic diseases	None	129 (9.5)	1225 (90.5)	<0.001
	Any	407 (21.2)	1515 (78.8)	
Self-assessed Health	Excellent or very good	137 (9.5)	1302 (90.5)	<0.001
	Good	220 (18.1)	997 (81.9)	
	Fair or poor	178 (28.8)	440 (71.2)	
Healthcare provider	Public	444 (16.4)	2266 (83.6)	0.902
	Private	76 (16.0)	398 (84.0)	
Emergency department‡	Yes	119 (27.3)	317 (72.7)	<0.001
	No	361 (14.0)	2220 (86.0)	
Primary care‡	Yes	363 (20.3)	1425 (79.7)	<0.001
	No	151 (11.0)	1221 (89.0)	
Intimate Partner Violence¥	Yes	196 (18.6)	855 (81.4)	0.016
	No	340 (15.3)	1888 (84.7)	

*p=p-value from chi-square test;
†Chronic disease: asthma, chronic bronchitis, diabetes, digestive disorders, musculoskeletal diseases, cardiac pathology, severe depression or other mental illness, high blood pressure, stroke, migraine, epilepsy or fits;
‡At least one visit during the previous year;
¥Experience of any act of physical violence, sexual coercion or injury;
Total values differ due to missing information.

Except for education, financial strain, type of health provider and utilization of healthcare, the prevalence of intimate partner violence was significantly different according to levels of the characteristic assessed and presented in Table 2. Among participants who forgone healthcare, the proportions of victims-only, perpetrators-only or involved in IPV as both (any act of physical, sexual coercion or injury), were 6.0%, 9.1% and 21.5%, respectively. The proportion of victims-only was highest in London (7.4%) and lowest in Stuttgart (3.4%). Bidirectional IPV reports were highest in Stuttgart (29.7%) and lowest in Budapest (7.5%), while the proportion of perpetrators-only was highest in Athens (16.2%) and lowest in Porto (6.0%). According to sex, a highest proportion of victims-only was observed in women (6.6%). Bidirectional and perpetration-only were highest among men (18.0% and 12.3%, respectively). The proportions of the three types of violence involvement decreased with age and were higher in the absence of a chronic disease.

The association between forgone healthcare and IPV was different according to the type of involvement: no significant associations were found for victims-only or perpetrators-only, but compared to participants not involved in violence, those experiencing reciprocal or bidirectional IPV in the previous year were 1.5 times more likely to declare forgone healthcare (Table 3). After adjustment for city of residence, self-assessed health, chronic diseases and financial strain, the association remained statistically significant (OR=1.41; 95%CI=1.09-1.81).

Table 2. Social and demographic characteristics and health-related outcomes, by type of involvement in intimate partner violence (victims, perpetrators, bidirectional).

		Intimate Partner Violence				
		No	**Victims**	**Bidirectional**	**Perpetrators**	
		n (%)	**n (%)**	**n (%)**	**n (%)**	**p***
City of residence	Athens	291 (54.1)	39 (7.2)	121 (22.5)	87 (16.2)	<0.001
	Budapest	441 (75.3)	34 (5.8)	44 (7.5)	67 (11.4)	
	London	330 (64.6)	38 (7.4)	85 (16.6)	58 (11.4)	
	Östersund	438 (80.1)	24 (4.4)	50 (9.1)	35 (6.4)	
	Porto	435 (72.6)	34 (5.7)	94 (15.7)	36 (6.0)	
	Stuttgart	293 (58.8)	17 (3.4)	148 (29.7)	40 (8.0)	
Sex	Male	892 (65.3)	59 (4.3)	246 (18.0)	168 (12.3)	<0.001
	Female	1336 (69.8)	127 (6.6)	296 (15.5)	155 (8.1)	
Age	18-24	206 (56.0)	30 (8.2)	77 (20.9)	55 (14.9)	<0.001
	25-34	401 (59.4)	51 (7.6)	148 (21.9)	75 (11.1)	
	35-44	502 (66.6)	40 (5.3)	131 (17.4)	81 (10.7)	
	45-54	500 (70.9)	32 (4.5)	107 (15.2)	66 (9.4)	
	55-64	619 (79.7)	33 (4.2)	79 (10.2)	46 (5.9)	
Marital Status	Single	532 (62.7)	58 (6.8)	161 (19.0)	98 (11.5)	0.002
	Cohabiting	350 (67.7)	29 (5.6)	75 (14.5)	63 (12.2)	
	Married	1020 (69.4)	77 (5.2)	249 (16.9)	124 (8.4)	
	Divorced/S/W†	323 (73.6)	22 (5.0)	56 (12.8)	38 (8.7)	
Education	University	950 (68.9)	75 (5.4)	232 (16.8)	122 (8.8)	0.251
	Secondary	1045 (66.4)	94 (6.0)	265 (16.8)	169 (10.7)	
	Primary	176 (72.7)	10 (4.1)	31 (12.8)	25 (10.3)	
Financial strain	Never	738 (71.2)	57 (5.5)	157 (15.2)	84 (8.1)	0.126
	Often	1109 (66.1)	95 (5.7)	291 (17.3)	184 (11.0)	
	Always	371 (67.3)	34 (6.2)	91 (16.5)	55 (10.0)	
Chronic diseases‡	None	874 (64.5)	92 (6.8)	234 (17.3)	154 (11.4)	0.002
	Any	1351 (70.3)	94 (4.9)	308 (16.0)	169 (8.8)	
Self-assessed Health	Excellent or very good	965 (67.1)	101 (7.0)	228 (15.8)	145 (10.1)	0.028
	Good	817 (67.1)	56 (4.6)	222 (18.2)	122 (10.0)	
	Fair or poor	443 (71.7)	29 (4.7)	90 (14.6)	56 (9.1)	
Healthcare provider	Public	1846 (68.1)	150 (5.5)	434 (16.0)	280 (10.3)	0.087
	Private	310 (65.4)	34 (7.2)	91 (19.2)	39 (8.2)	
Emergency department¥	Yes	287 (65.8)	21 (4.8)	83 (19.0)	45 (10.3)	0.426
	No	1741 (67.5)	157 (6.1)	422 (16.4)	261 (10.1)	
Primary care¥	Yes	1233 (69.0)	92 (5.1)	289 (16.2)	174 (9.7)	0.166
	No	899 (65.5)	89 (6.5)	241 (17.6)	143 (10.4)	
Forgone Healthcare	Yes	340 (63.4)	32 (6.0)	115 (21.5)	49 (9.1)	0.008
	No	1888 (68.8)	154 (5.6)	427 (15.6)	274 (10.0)	

*p=p-value from chi-square test;
†Divorced/S/W=Divorced, separated, widowed;
‡Chronic disease: asthma, chronic bronchitis, diabetes, digestive disorders, musculoskeletal diseases, cardiac pathology, severe depression or other mental illness, high blood pressure, stroke, migraine, epilepsy or fits;
¥At least one visit during the previous year;
Total values differ due to missing information.

Table 3. Association of intimate partner violence and forgone healthcare in victims, perpetrators and in participants involved in both (bidirectional or reciprocal).

		OR† (95%CI‡)	AOR¥ (95%CI)	AOR§ (95%CI)
IPV*	No	1.00	1.00	1.00
	Victims	1.15 (0.78-1.72)	1.38 (0.91-2.09)	1.35 (0.89-2.04)
	Bidirectional	1.50 (1.18-1.89)	1.44 (1.12-1.85)	1.41 (1.09-1.81)
	Perpetrators	0.99 (0.72-1.38)	1.07 (0.76-1.50)	1.03 (0.73-1.44)

*IPV= Intimate partner violence;
†OR= Odds ratio;
‡95%CI=95% Confidence intervals;
¥AOR= Adjusted odds ratio for city of residence, chronic disease and self-assessed health status;
§Further adjusted for financial strain.

Discussion

The present study showed that involvement in IPV plays a role in forgoing healthcare and that it is dependent on the type of violence involvement. The likelihood or reporting forgone healthcare is higher in those involved in bidirectional violence and statistically independent of potential confounders such as city of residence, chronic diseases, quality of self-assessed health or financial strain. Although statistically non-significant, victims-only also presented higher odds of forgone healthcare.

Study limitations must be addressed: the different sampling procedures taken in each city may be a source of selection bias, although previous analysis showed that within cities where two different strategies were used (Porto and London), different sampling procedures resulted in participants with similar characteristics (17). Previous analysis also revealed that the proportion of more educated people in the study sample was higher than in the population. This might have resulted in an underestimation of violence and of forgone healthcare, once more educated people can be expected to more easily overcome financial barriers and leave violent relationships (3). Since information was self-reported it can add ambiguity due to forgotten, undisclosed or socially desirable answers, especially expected when dealing with these sensitive and private issues. Although this is a subjective statement, it clearly indicates an important discomfort with the healthcare system, and it could also indicate a lost chance for improving the health status.

We did not consider detailed economic or psychosocial reasons as determinants of forgoing healthcare. Difficult events in childhood and financial difficulties in adulthood have been associated with forgoing care (16, 23). A recent large Swiss study (22) showed that the question which was best associated with the risk of forgoing healthcare was ‘‘During the last 12 months, have you had trouble paying your household bills (taxes, insurance, telephone, electricity, credit cards, etc.)?’’ and compared to those who responded negatively, those who replied positively were 11 times more likely to have forgone healthcare. We used a similar

question to measure material deprivation and it also presented a significant association with forgoing healthcare. However, the impact of IPV in forgoing healthcare was not affected by adjusting for financial strain. Nevertheless, issues of forgone care could provide an important link between health inequalities and healthcare provision.

We did not explore the presence of specific organizations and policies regarding IPV or guidelines in use within each national health system that might influence the decision to seek healthcare. However, the associations found remained statistically significant in city- and healthcare provider- adjusted models (result not shown), thus in favor of valid associations across health systems.

Finally, reciprocity of IPV does not necessarily mean that the frequency or the severity of the violence is equal or similar between partners and the lack of such information make generalizations more cautious.

In our sample, the prevalence of forgone healthcare was 16.3% but varied significantly across cities, from 12.8% in Athens and Budapest to 22.3% in Stuttgart. The overall proportion was similar to that found in a population-based survey in Switzerland, where 14% of respondents reported forgone healthcare for economic reasons (2). In Östersund, we found a lower proportion of forgone healthcare (17.7%) compared to a 2001 Swedish national postal survey showing that 24% of citizens refrained from visiting a physician despite a perceived need during the previous three months (24). In 2000, nearly 24% of the French respondents to a representative annual survey of healthcare utilization stated that they had forgone healthcare at least once in their lifetime because they could not afford it, and 15% indicated they had done so in the year preceding the survey (25). The proportions vary markedly with age, gender and household size but also according to income levels, occupational status and welfare coverage, regardless of complementary health insurance supplementing basic national health coverage.

A study performed in five underprivileged areas of the Paris region during 2001 found a strong link between life-course experience of physical, sexual or psychological abuse and forgone care, although focusing on financial reasons (16). Since it used a single (yes/no) question to assess violence, it was unable to disentangle the effect of the victim or perpetrator condition. In our study, the association was only significant for those involved in the so called bidirectional IPV, as measured by the Revised Conflict Tactics Scales. There was an association with the victim role of similar magnitude but non-significant which could be the result of statistical power limitations.

Women victims of IPV are likely to refrain from seeking help (26), often undervaluing the severity of any symptom derived from their exposure and fearing consequences of their

disclosure (13, 27). The findings of studies based on clinical samples and battered women's agencies showed that experiences of severe, life-threatening physical abuse frequently result in delayed help seeking (28). The US 2002 National Survey on Drug Use and Health data was used in two separate studies to assess the relation of unmet need for mental healthcare with IPV victimization of women (14) and with IPV perpetration by men (15) and both found statistically significant associations with experiences of IPV representing increased likelihood of forgone mental healthcare. Even though we did not specify the type of healthcare forgone, if any, (as opposed to focusing in mental health) our analysis suggests that such association is also present in the European general population.

Much of the initial research on IPV was conducted with severely abused women and supported the assumption that IPV is primarily perpetrated by men against women. Data is mounting, however, suggesting that IPV is often perpetrated by both men and women against their partner (29, 30). It is also becoming recognized that perpetration of IPV by both partners within a relationship is fairly common. This phenomenon has been described with terms such as mutual violence, symmetrical violence, or reciprocal violence (31). Here we use the terms reciprocal or bidirectional to indicate IPV that is perpetrated by both partners in a given relationship.

If intimate partner violence occurs as a result of escalating conflicts, bidirectional IPV should be more serious because it would indicate that both partners are engaging in the escalation of conflict. A large American study in young adults showed that, in fact, bidirectional IPV was associated with greater injury than was nonreciprocal IPV, regardless of the gender of the perpetrator (32), although it has also been related to less severe patterns of violence involvement (31, 33). In our study, we did not characterize the types of violence against partners making distinctions between common couple violence, violent resistance or mutual violent control (31), although, it has been stated that most violence in general population samples is common couple violence, less likely to involve severe violence (34). By showing a link of bidirectional violence to forgone healthcare regardless of several potential confounders, even if mainly describing common couple violence, our results suggest that the bidirectional pattern in IPV might be, in fact, associated with harsher health consequences, here denoted by occasions where healthcare was needed but not sought.

While sound knowledge on major factors that characterize vulnerable populations is central to reduce barriers in the access to healthcare, our findings emphasise the need to include IPV amongst these concerns. Intimate partner violence is associated with a number of negative psychological and physical health consequences including posttraumatic stress disorder, depression, physical injury, reproductive health problems, irritable bowel syndrome, and chronic pain (3). They all point towards an increased need of professional guidance.

Recognizing the role of IPV in delayed or forgone healthcare and increasing the opportunity to receive timely and preventive care may thus ultimately improve health outcomes and further help to stop violence.

Contributors

DC, EH, EI, JL, JS, OS, OT and HB were involved in the research design and data collection procedures. DC performed the statistical analysis of this manuscript and wrote the first draft of the paper. All authors revised the manuscript critically for important intellectual content. All

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5. General discussion

Despite the growing awareness and actions taken for the combat of preventable violent behavior, less visible forms remain prevalent all over the world. This is the case of intimate partner violence (152). The high prevalence of IPV observed globally and the associated morbidity (163), clearly make it a serious public health issue.

To address this phenomenon, we followed a public health approach. This demanded a rigorous assessment, which we envisaged in sequential steps: through systematically scoping the literature on measurement options; collecting data on the magnitude of the problem at the population level and cross-culturally; and examining different profiles of selected characteristics and consequences of IPV taking sex and IPV directionality into account and studying characteristics of healthcare services that might benefit those considered socially most vulnerable and those experiencing IPV.

There are specific features that distinguish the cross-sectional study performed on IPV from other national and multicentre surveys on this subject: the study was specifically designed to measure IPV and its associated factors, as opposed to studies documenting solely on IPV or using an IPV module of questions embedded in a larger health survey, even though the health context of our survey was emphasized and acknowledged by participants; additionally this was the first cross-country European study assessing men and women, agreeing with recommendations from different ethical committees over a sensitive phenomenon; besides physical assault and sexual coercion, this study also covered psychological aggression and injury, which has been rarely documented in men and women, using the same instrument.

The study on mental healthcare provision for marginalized groups, similarly, used a common methodology to assess more than 600 services across 14 European cities. The same criteria were used to identify services in all cities and all services were assessed using the same instrument.

A series of limitations raised in the international studies described must also be addressed.

First, in the design of the multicentre study assessing IPV in men and women, several methodological differences were present across centres, namely in participants recruitment and administration methods. One important limitation concerns the cooperation and response rates of our samples that were not possible to collect. Nevertheless, the use of registry-based sampling (municipal or electoral) and random route, were expected to provide the necessary “coverage” of the target population, ensuring the grounds for creating probabilistic samples, ultimately aiming to represent that population.

Information on refusals was also not collected and, in some cases, it was even impossible to obtain due to the sampling procedures. As in many multicentre studies, different procedures are taken in each site, as a result of specific ethical recommendations, logistical and time

limitations. The comparison of characteristics of participants sampled from different sources, within the same country, was conducted for the Portuguese and UK samples (the remaining countries used only one sampling frame to identify participants: Greece and Hungary by random route, Sweden, Spain, Germany and Belgium through municipal or state person registries). Results from this comparison confirmed that, despite minor differences (more men and younger participants recruited via public vs. electoral registry in London), IPV prevalence was similar (Table III in Supplementary data, Paper II). Therefore, it can reasonably be assumed that participants' characteristics were similar, independently of the sampling method used.

The fact that we assessed people more educated compared to the Eurostat national estimates may have led to an underestimation of IPV and of the factors explored, once more educated people tend to have better health outcomes (164) and may report less forgone care, particularly for economic reasons (165).

Also, in the study assessing mental healthcare provision, the understanding of the categories listed in the assessment tool and the terminology used is likely to have varied across countries and also among interviewees in the same city. Furthermore, social desirability may have been present in all answers and, although comprehensive definitions have been used, the results may not be generalized to other marginalized groups or cities.

The "intimate" character of the type of violence studied, although not an argument for inconsideration of a "public" matter, poses unique challenges for its' unravelling. To understand which factors increase the risk for violence victimization and perpetration, the measurement of violent behavior must first be valid. This is often not the case, as exemplified by a third of the studies analyzed in our scoping review that used purposefully created questions not operationalizing which acts describe the violence type and nature. The choice for a standardized tool seems to be dependent on the setting and method of administration, and prevalence estimates fluctuate according to the instrument used.

Amongst the standardized tools for IPV measurement, the Conflict Tactics Scales is the most commonly used, for both male and female and their experiences as victims or perpetrators. The use of the CTS to estimate the prevalence of IPV has been criticized because of neglecting the seriousness of the injuries inflicted and lack of consideration for the context or underlying motivation for violence initiation (126). While the latter should be the focus of a more qualitative in-depth investigation, the first argument was refuted by the revision of the CTS, which was extended to encompass sexual coercion acts and injury elements. This revision also included subscales of severity within each violence type assessed, that take into account the propensity of acts to result in injuries requiring medical attention. However, when using the CTS, researchers usually consider "any positive item" sufficient to code a

prevalent case of violence and this may lead to an over-estimation of the true violence rates. This has implications, namely for the sex-difference debate in IPV prevalence, since an increased number and repetitive use of violent acts would be the norm of male perpetration (29).

We resorted to the CTS2 to measure IPV and observed a great geographical variation across European cities. Men and women experienced repeated episodes of minor and severe acts of violence and bidirectional IPV was preponderant in all sites. To be involved in bidirectional violence means to have been both a victim and a perpetrator of violence (166-169). This has also been called reciprocal or mutual violence. Those exploring this dyadic nature of IPV, have essentially used the CTS and find that bidirectional violence is more common, than unidirectional violence (166, 170, 171).

We argue that victims and perpetrators should be identified in both genders, and that experiences of bidirectional IPV seem associated with poorer health outcomes. Bidirectional IPV seems also to follow a socioeconomic gradient in men and women, suggesting that couples, compared to women-only, might benefit most, from interventions designed to tackle inequalities.

Previous measurements distinguishing women's and men's involvement as both victims and perpetrators of IPV in the general population are essentially limited to adolescent samples from the US (31, 172), or university student samples (173), where gender roles may still be in definition and where the female and male social status might not be representative of adult relationships. When measured in clinical settings, bidirectional violence has been more strongly associated with adverse health outcomes than unidirectional violence (174). Among 1044 high-risk African-American pregnant women, 5% were victims-only, 12% perpetrators-only and 27% involved in bidirectional physical and sexual violence in the previous year. Those involved in bidirectional IPV were more likely to drink, use illicit drugs and reported the highest levels of depressive symptoms compared to those reporting victimization-only, perpetration-only or no violence. However, victims-only were more likely to have a preterm birth and low birth weight infants (167).

Other results from USA data suggest that bidirectional IPV, besides being more frequent, might be associated with more serious injury (166, 175). And a study in 240 couples residing in Rwanda, found that perpetrators-only and those involved in bidirectional physical IPV were more likely to report mental health problems, than victims and people not involved in IPV, although associations were non-significant (176).

Ideally, the evaluation of couples would allow a better picture of IPV and provide useful information on the sex differences observed for prevalence estimates. However, assessing couples may increase the risk of violence (125). Therefore, relying on individual reports of victimization and perpetration is a safer option. But such approach also raises the question of

potential reporting bias adding increased difficulty in settling the existing sex-symmetry debate: do women and men over- or underreport their victimization or perpetration? A meta-analysis on the reliability of the CTS using couple and non-couple CTS data showed that underreporting of perpetration is present in both sexes, and that it may be greater in men (177), although support for underreporting was not found in posterior results obtained in representative sample of USA adolescents (166, 178).

Similar to our study, previous multicentre studies, namely the WHO Study of Women's Health and Domestic Violence (23), and the International Violence Against Women Surveys (67), also found great geographical variability, although only the perspective of victims is available. The original plan of the WHO multicenter study on violence against women, a landmark informing violence policies worldwide, was to include interviews to a subpopulation of men about their experiences and perpetration of violence, including partner violence. In their words, "this would have allowed researchers to compare men's and women's accounts of violence in intimate relationships and would have yielded data to investigate the extent to which men are physically or sexually abused by their female partners" (125). The reasons enumerated for not doing so were the safety of women if their partners were asked the same questions, which could lead to re-victimization, and the costs involved in sampling new households.

Since the bulk of studies on IPV focus on women victims of violence at the hands of their male partners, comprehensively, the currently available interventions focus on secondary and tertiary prevention strategies aiming to restrict or correct male perpetration and to provide protection and support for female victims (179, 180). Even though evidence showing that women and men in intimate partnership, particularly in Western nations, use aggressive acts with similar frequency towards each other (64-66).

In Europe, despite legal nuances (e.g. definitions, length of penalties) several types of IPV are considered a public crime. In most countries, police officers receive training in dealing with violent behavior amongst intimate partners. However, authority's interventions are not yet proved effective and depend on the subject's will to disclose. Furthermore, reminiscences of cultural stereotyped values of masculinity and femininity may play a role in western societies, for example inhibiting male's disclosure of victimization to authorities, which is in line with the sex asymmetry found in criminal records (90, 181). Studies performed in developing countries (10, 97, 98), have found that attitudes towards violence acceptance (e.g. agreement to statements such as: is a husband justified in hitting or beating his wife if she burns the food or argues with the husband or goes out without informing or neglects the children, or refuses to have sexual relations?) (182) and women's empowerment (98) are predictive of women's violence victimization. But in most developed nations, gender equality initiatives, including violence reduction campaigns, have been in practice for several years,

although these may have had a different impact on each culture. For example, a 2010 Special Eurobarometer survey on domestic violence against women (183) found that 6% of male and female participants in Greece have “ever heard about domestic violence against women” through colleagues or contacts at their workplace and this percentage was 43% in Sweden, which is indicative of different levels of acceptability in the disclosure of IPV across Europe. On the other hand, reductions in government expenditure and democratic backwardness in terms of gender equality have emerged as potential determinants of femicide (184). A significant negative ecological correlation between female physical assault victimization and gender empowerment (185) has also been documented across 16 western nations, and a multilevel analysis of 7667 university students from 38 sites (part of the International Dating Violence Study), showed that the greater the status of women in society (as measured by an index derived from United Nations’ indicators on gender equality), the higher the male sexual coercion victimization (186).

In our study, although statistically non-significant, the 2013 Gender Equality Index (European Institute for Gender Equality - EIGE) (187) was negatively correlated with female victimization and male perpetration of physical assault, and positively correlated with male victimization and female perpetration of this type of violence (Table 3), thus in line with previous ecological correlations observed in western nations. Moreover, most estimates suggest an inverse relation between the EIGE index and violence, supporting the need to continue striving for gender equality.

Table 3. Correlations between intimate partner violence prevalence and the Gender Equality Index (EIGE, 2013).

IPV	Victims		Bidirectional		Perpetrators	
	Women	Men	Women	Men	Women	Men
Psychological aggression	0.238	0.190	-0.048	0.214	-0.228	-0.357
Sexual coercion	-0.286	-0.240	-0.143	-0.143	-0.707	-0.333
Physical assault	-0.143	0.252	-0.036	-0.168	0.262	-0.287
Injury	-0.241	-	-0.286	-0.190	-0.299	-0.359

IPV- Intimate partner violence;

There are societal-level factors that may influence the prevalence and be specific to each violence type, as demonstrated by a multilevel analysis using elder abuse assessed in seven European centres: city mean-educational level was relevant for explaining city-differences in psychological abuse prevalence, whereas the Gini coefficient (as a measure of economic inequality) was relevant essentially for financial abuse (91). However, to study higher-level factors impacting on the frequency of IPV experiences also pose methodological difficulties, namely an ecological bias common to multilevel or hierarchical analysis. But such

approaches commonly generate multiple new hypotheses, opening the ground for further tests that can be implemented at the individual level.

Our results are also in line with studies showing poorer health-related associated outcomes in women than in men experiencing violence. Therefore, the value of existing preventive campaigns (for instance, ensuring equal opportunities of education, media advertisements raising awareness for the criminal nature of violence against women), should be preserved but these should also consider the dynamics of violent behavior in both genders. Men and women should be involved in the development and implementation of interventions and the safety of both genders should guide decisions.

Lastly, there are missed opportunities to detect IPV in healthcare settings (188) as reiterated by several organisms standing for IPV screening in health encounters (132). Our results suggest that IPV is a further barrier in the access to healthcare, which calls for the implementation of preventive actions to take place at the community level.

Several specialized services for victims and perpetrators of violence have set up telephone hotlines, which may be a more accessible and acceptable way for violence disclosure. But still, do not respond to a much needed, primary prevention action.

School campaigns aiming to change attitudes or behavior, from an early age, might be a more effective way to prevent violent behavior in the long run.

Healthcare systems could also play a major role in violent behavior prevention. Healthcare workers are frequently the first to see victims of violence. Their skill, opportunity and reputation, place them in a privileged position for reaching vulnerable communities, particularly when outreach or similar programs are implemented. Intimate partner violence screening in healthcare encounters has not been yet fully accepted as beneficial, but the need for inclusion of IPV issues in healthcare staff curricula and training is obvious.

Violent behavior does not fit contemporary societies' demand for well-being, dignity and human rights preservation. Public health is concerned with all these aspects, thus its aims include engaging in all efforts possible to the creation of safe and healthy communities, starting by identifying, relating and ultimately, reducing violence. This work shed a small light in the "invisible" violence experiences of European adults.

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